QST

June, 1938
25 cents

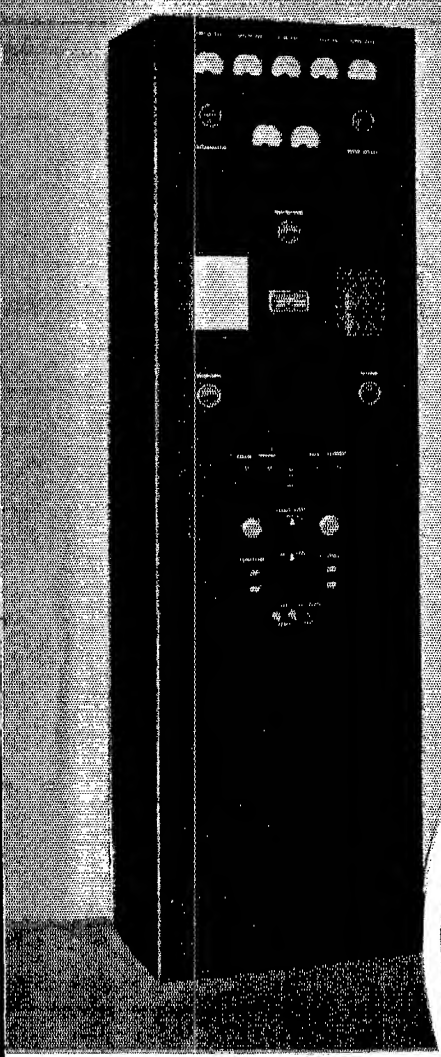
devoted entirely to

amateur radio

In this Issue—

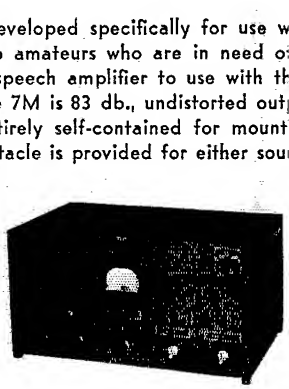
Efficient Modulation With Beam-Power Tubes

Boon Companions: Transmitter, Amplifier, Tube

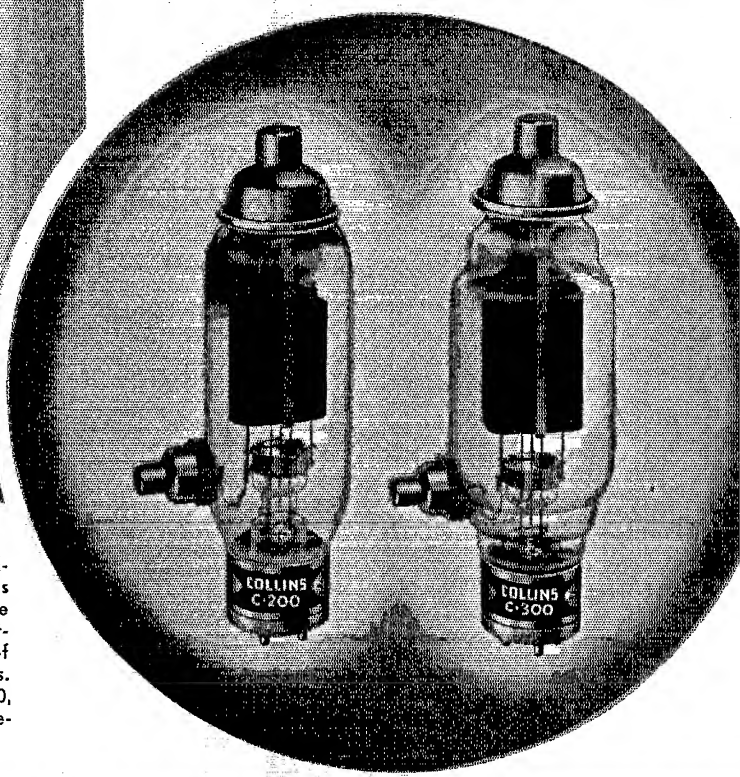


The 600A Transmitter is finding many applications in comm
cial services. Of course it is also a beautiful set for amat
work. The high CW output (700-800 watts) and the radiopho
power in excess of 200 watts qualify it for difficult communicat
applications.

The 7M Speech Amplifier, developed specifically for use w
the 600A, may be of interest to amateurs who are in need o
properly shielded, high quality speech amplifier to use with th
present transmitter. Gain of the 7M is 83 db., undistorted outp
is 7 watts. The amplifier is entirely self-contained for mount
on the operating desk. A receptacle is provided for either sou
cell or diaphragm crystal mi-
crophone. A single shielded
cable connects the audio and
push-to-talk circuits to the
transmitter. Volume indicator
is optional. Output connec-
tions may be supplied for
either class B plate or grid
modulation systems.



7M AMPLIFIER



The 600A Transmitter uses two Collins C200's for CW or two Collins C300's for CW and telephone. These tubes are capable of very high output and low distortion either as r-f amplifiers or as class B modulators. Price of C200, $24.50; of C300, $35.00. Data sheets supplied on request.

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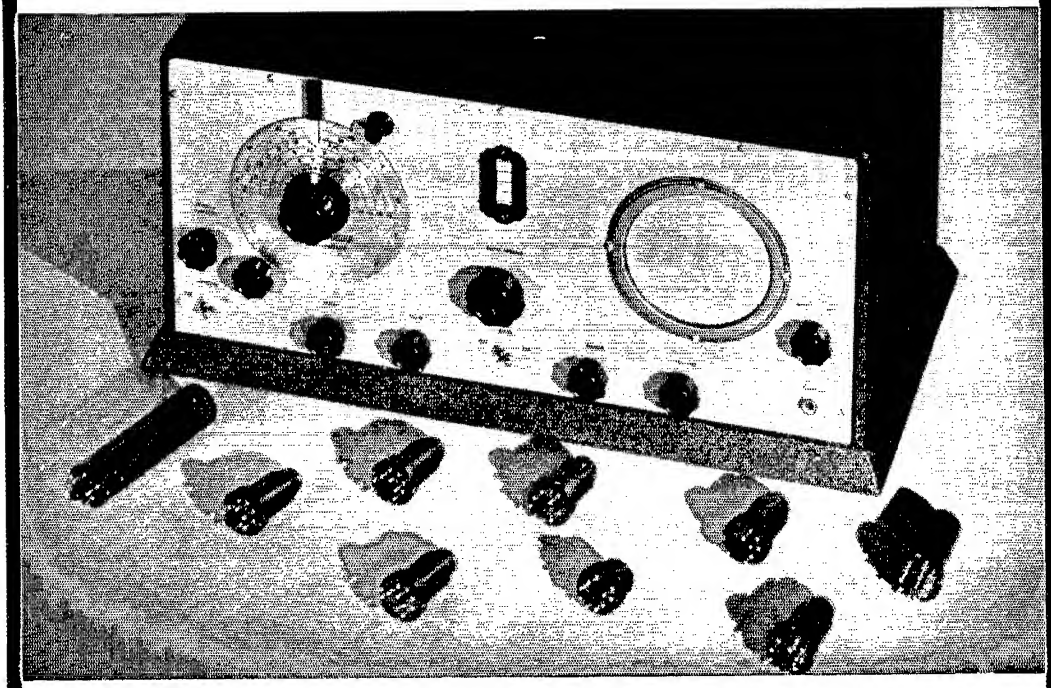

- Metal Tubes — Dovetail perfectly with our efforts to improve signal to noise ratio — eliminate noisy tube shields — reduced interelectrode capacities and shorter leads afford greater gain.
- Iron Core I. F. system — greatly increased sensitivity and a signal to noise ratio unattainable with an air core system.
- Duo-Micro-Vernier Band Spread — provides improved logging accuracy — provides electrical band spreading and micro-vernier tuning in an exclusive and distinctive dial.
- More efficient Crystal Filter Circuit, controlled by variable knob on front of set gives one signal selectivity — without reducing sensitivity.
- Beat Oscillator with continuous range.
- Modern Band Changing System — any desired bands in the short-wave spectrum with the turn of an exact positive switch — no cumbersome plug-in coils.
- Compact — all completely enclosed in one convenient and efficient cabinet 19½" x 10" x 10".

★ When you install the Super Skyrider you have every modern feature known to radio, plus the progressive engineering that keeps pace with the latest developments and trends in short wave reception.

Examine the marvelous 1936 Super Skyrider. Compact, convenient, efficient, it's the embodiment of today's trends in radio engineering, and incorporates, too, the brilliant Hallicrafters engineering developments. It's orderly and workmanlike, different from the old-fashioned, loosely wired, separate parts that constitute the receiver of the past. Amateurs today want the compact convenience of the Super Skyrider.

There are no cumbersome, inconvenient, plug-in coils used in the Super Skyrider — modern receiver design and layout permit the use of a simple band switch that tunes in any band with a twist of the finger, while the Automatic Band Indicator shows it on the dial. Here's convenience to the Nth degree, obtained without sacrifice but with actual gain in efficiency.

The Super Skyrider is engineered for the New Metal Tubes, radio's great advance for 1936. Completely shielded, with short leads and small interelectrode capacities, they provide the last link in Hallicrafters' efforts to build a stable, high gain set.

Sensitivity is brought to a still higher level with the new Iron Core I. F. Transformers, first used in the Super Skyrider and now rapidly being adopted by the more progressive manufacturers.

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the hallicrafters

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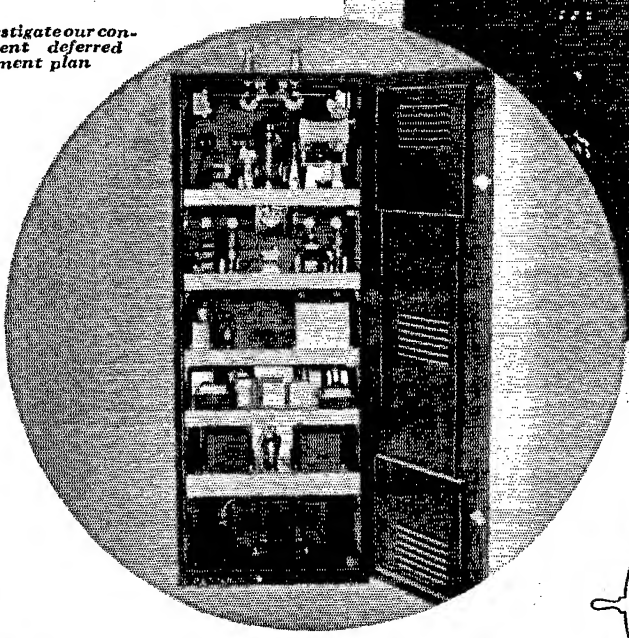

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JUNE
1936

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Number 6

★

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Additional second-class entries to cover sectional editions authorized March 20, 1935. Title registered at United States Patent Office.

The Contents

Pri. Ohms P to P	SECONDARY RF LOAD IMPEDANCES AVAILABLE											‡AUDIO LOAD IMPEDANCE	
2000	1070	1950	2150	3620	3920	4300	6350	6550	7900	8600	11400	200	350
3000	1620	2950	3240	5500	5900	6500	9400	10000	11800	13000	17000	300	520
4000	1380	1850	2160	2850	3450	4300	5500	7300	8650	12500	17400	250	400
5000	1730	2300	2700	3500	4300	5400	7000	9150	10800	15700	21600	300	500
6000	1070	2140	2180	2750	3620	4250	4300	5150	6350	8300	8600	200	370
7000	1250	2400	2500	3200	4280	5000	5050	6000	7300	9700	10000	230	430
8000	1440	2760	2900	3700	4900	5650	5800	6900	8400	10000	12000	270	500
9000	1620	2050	3100	3240	3900	4150	6200	6500	7750	9400	12500	300	550
10000	1800	2300	3600	4300	4600	6100	6900	7100	8600	10500	14000	330	600
12000	2070	2150	2750	4250	4320	5150	7250	8300	8700	12500	17400	370	400
14000	2440	3200	4900	6000	9700							430	
16000	2780	3700	5600	6900	11000							500	
18000	3140	4150	6300	7750	12500							550	
500*	1070	1950	2150	3620	3920	4300	6350	6550	7900	8600	11400		

* In some cases it is desired to match an RF load to the 500 Ohm output of a PA amplifier. The terminal arrangement noted will take care of this application.

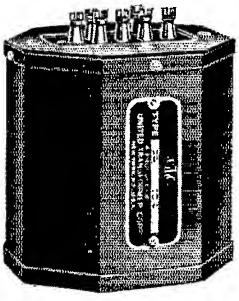
‡ These impedances are suitable for PA applications. If a monitor speaker is desired, proper distribution of power is obtained by operating this low impedance into the high impedance primary of the speaker transformer.

TYPICAL APPLICATION EXAMPLES

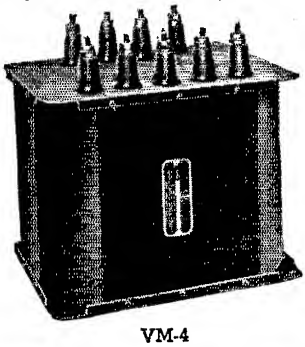
VM-1, Class B 46's—25 watts AF. P to P Z=6000 ohms modulating a single 35 T at 650 V and 77 MA.-RF load impedance is 8450 ohms. Corresponding to 6000 ohms in the left hand column we find the nearest available impedance in the other columns to be 8300 ohms giving an impedance match within 1.8%.

VM-3, Class B 35 T's—1000 V—P to P Z=10,000 ohms 115 watts AF—To modulate 2-203A's at 1000 volts and 230 MA.-RF load impedance is 4350 ohms. Corresponding to 10,000 ohms in the left hand column we find the nearest available impedance in the other columns to be 4300 ohms giving an impedance match within 1.2%.

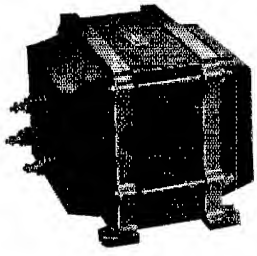
VM-4, Class B 203 A's—1250 V—P to P Z=9000 ohms 260 watts AF—modulating a 150 T at 2500 V and 208 MA.-RF load impedance to 12,000 ohms. Corresponding to 9000 ohms in left hand column we find the nearest available impedance in the other columns to be 12,500 ohms giving an impedance match within 4%.



VM-1



VM-4



VM-5

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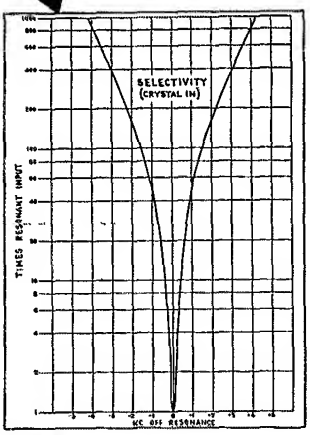

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It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors. The League is non-commercial and no one commercially engaged in the manufacture, sale or rental of radio apparatus is eligible to membership on its board.

"Of, by and for the amateur," it numbers within its ranks practically every worth-while amateur in the nation and has a history of glorious achievement as the standard-bearer in amateur affairs.

Inquiries regarding membership are solicited. A bona fide interest in amateur radio is the only essential qualification; ownership of a transmitting station and knowledge of the code are not prerequisite. Correspondence should be addressed to the Secretary.

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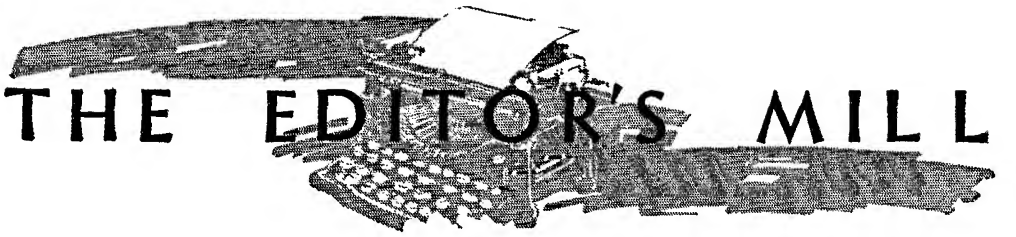
Address all general correspondence to the executive headquarters at West Hartford, Connecticut



FROM where we sit, it seems to us that amateur 'phone is acquiring quite a bad name fcr causing interference to other services. We have the feeling that 'phone men ought to take better account of this situation than they apparently are, and undertake the necessary remedial steps. Of course c.w. stations cause interference too, particularly by means of their harmonics, but the resultant trouble isn't nearly so pronounced for the reasons that the average 'phone station uses more power, it is so much more readily identified, its carrier is on constantly, and its emission is broader.

The interference falls into two general classes: that with normal broadcasting and that with higher-frequency services. It is distressing to think that in this advanced day, when we have so thoroughly learned the lessons of coöperation, there should still be amateurs who insist upon their right to transmit uninterruptedly even under circumstances where they inevitably cause "general interference to the reception of broadcast programs with receivers of modern design." Yet there seem to be. It may be argued that it is the duty of the communications administration to police these cases and impose quiet hours as a lawful measure of the required coöperation. Indeed it is, but have we not learned by tortured experience that it is vastly preferable for us individually to take the initiative, cure the troubles where we can, and be considerate? While fortunately these cases of aggravated interference are not common, still there are too many of them. It is not a good thing for amateur radio to have thoroughly outraged BCL's campaigning against us. Indicative of the feeling that can be generated in these cases, we quote the following from a letter shown us by one of the major broadcasting companies:

"I wish to bring to your attention a condition which is undoubtedly depriving you of thousands of listeners. I refer to the status of the amateur radio broadcaster. There is one in my apartment building. I hear his inane conversations throughout your broadcasts in the middle of Major Bowes' program, in the middle of your gorgeous General Motors program, and all of your programs are ruined for me through the intrusion of the raucous voice of this amateur calling his stations. I have complained to the Federal Communications Commission and find these people apathetic, in fact decidedly unsympathetic to my problem. They are all probably amateurs themselves down there. I am now discovering that this amateur is disturbing so many tenants in my building that I think we can organize a committee to persuade the landlord to silence this nuisance. But the condition remains—that is, these licensed radio amateurs are allowed by a friendly radio commission to destroy the radio reception of thousands of owners of radios. I am going to call this matter to the attention of my elected representatives in Congress but I think your company with its vast expenditures to make radio programs accessible to the public should be able to do something about such a shocking condition. If an intruder comes into one's home one can call the police. When we invite our radio guests (your programs) must we (your sponsors' potential customers) remain helpless when these intruders (the unrestrained amateurs) invade our homes?"

Of course the F.C.C. did not rush to the assistance of this complainant without investigating—we have our rights too. Perhaps the interference wasn't general and it is quite possible that the complainant's receiver was an ancient model not entitled to any protection. But it does us no good to have such people annoyed to the boiling point while we ignore their anguished wails. Not many amateurs pursue such a calloused view but our very point is that *some* do decline any coöperation or consideration—and in our observation it's generally a 'phone station. This, we say, is not a wise course.

The other fruitful cause of headaches is harmonic radiation. The biggest item in this category is third-harmonic interference with the so-called 25-meter broadcast band on which unnumbered people with all-wave receivers are now listening to foreign programs. Unfortunately, the third harmonic of most of the 3900–4000 'phone band fall squarely upon this broadcast band, which runs from 11.7 to 11.9 mc. Here the trouble in almost every case is definitely the amateur's fault for we should not radiate harmonics that cause interference of the order that has been observed. Commercial c.w. services also have been bothered, particularly between 7820 and 7960 kc., this time by the second harmonics of 'phones operating between 3910 and 3980 kc. 'Phones in the 1800–2000 region similarly distribute their second harmonics through the greater part of our 80-meter band, and their thirds through a variety of other services, sometimes with R8 signals, sometimes just with "hash." It seems to us that c.w. stations

are just as prone to emit harmonics as 'phone stations but the peculiar circumstances have combined, as we mentioned above, to make it the 'phone stations that are the ones causing most of the grief, and experiencing it.

It is readily possible to determine whether there is harmonic radiation or general BCL interference. The methods of curing these difficulties have been well treated in the literature of our art. We urge 'phone amateurs to give heed individually to the predicament in which their game finds itself. A job needs to be done, and it must not be defaulted. Our prestige is dependent upon coöperation and fair play.

OCCASIONALLY we get a letter from an old-timer lamenting the decline of home construction in amateur stations, expressing concern about the extent to which advertised merchandise appears in the station descriptions in *QST* and in our own constructional articles, and deploring the tendency of amateur builders to make their stations too swanky and "commercial" in appearance.

The staff of *QST* feels a heavy responsibility in its endeavors to supply proper design and construction information. We examine all of these comments with the greatest care. It seems to us, though, that these lamentations for the "good old daze" are of the sort that come over all of us at times when we feel that the procession is getting a little too fast for us. Amateur radio advances, the art does not stand still to wait for any man; and although we who are old-timers can think back yearningly of simpler days, we have to confess that we are unable to arrest history in its making.

It is inevitable that the parts used by amateurs in their stations, and used by us in our constructional articles, are advertised parts. If they were not advertised by the makers they couldn't be sold. It is impossible to ignore the fact that in these days innumerable handy and time-saving gadgets are available to the ham. If, in the determination to be individual, we in our constructional articles or amateur builders doing original work should insist upon going to the trouble of fabricating parts which are already available at reasonable prices, we would all only succeed in making ourselves look foolish. Moreover, there is very little in the practice of the earlier days in radio which is not definitely inferior to some more modern development. This applies both to technique and to available apparatus. When one is doing a job to-day, and starting from scratch, it would be absurd not to use the more modern practice and the more modern gear.

Some amateurs bemoan the rate at which amateur radio is progressing technically, and particularly the fact that some of the newer devices are so complicated as almost to defy home construction. This is understandable when one contemplates that the price of avoiding obsolescence in station equipment in a rapidly-moving art is pretty high. This angle, we say, we can understand. But we do not think it justifies viewing with alarm the purchasing of ready-made equipment as the beginning of the end of the real amateur. In the earlier days it was certainly every ham's ambition to own a Paragon or C.R.L. or Grebe receiver. Mighty few made their own transformers or condensers or gaps—not when they could scrape up the cash to buy one of the advertised varieties that the big stations used. The language and the technique change but human nature is just about the same as it was fifteen or twenty years ago. We still have those whose chief interest is in operating and those who possibly obtain an even greater satisfaction from building everything themselves.

But one does not to-day build apparatus in the 1923 manner nor even in the 1933 manner. Even our simple apparatus must be modern, described in modern language, using modern parts, and capable of modern performance. The early years of c.w. and of international DX were years of orienting ourselves, learning the new technique and discovering new operating worlds. The particular thrill that was a part of those pioneering days is to be regained now only by the workers in the ultra-high-frequency field. While we wouldn't give up for anything our precious recollections of those earlier days, it seems to us that present-day ham radio is indescribably better and more interesting than the old game.

K. B. W.

Illinois State Convention

(Central Division)

June 20th–21st

Place: Bloomington, Ill.
At: Illinois Hotel.
Time: Registration 2 p.m. Saturday.
Auspices of Central Illinois Radio Club.

Strays

Here's a "believe it or not": On January 6th W4VK had a three-way QSO on 75-meter 'phone with W5DSW of Pine Bluff, Ark., and W4APK of Rome, Ga. On signing off, a few minutes later he found himself in another three-way with W5SI, also of Pine Bluff, and W4DAY, also of Rome! All without any premeditation or prearrangement. Oh yes, we almost forgot — W4VK's QRA is Ripley, Tenn.!

A 50-Watt Audio Amplifier-Modulator With Beam Tube Output

Theory and Practical Operation of the New 6L6

By George Grammer,* W1DF

APPARENTLY the idea of confining the electrons flowing in the evacuated space inside a tube to directed beams is not of such recent origin, but, as always, it remained for someone with a practical bent to make a good theory into a better tube. This has been done by O. H. Schade, of RCA Radiotron, and a beam power tube designed by him has been added to the metal-tube series, carrying the designation 6L6. Primarily, the tube was developed to meet the low-distortion and high-power-output requirements of high-fidelity home reproduction; incidentally, it also fits nicely into the amateur picture. Among the appealing characteristics of the 6L6 are audio-power outputs up to 60 watts from a pair of tubes with only 400 volts on the plate, plate efficiency comparable to that of a good Class-B system although the tubes actually are operated Class-AB, high-power sensitivity, and negligible distortion in suitable circuits.

Amateurs usually are more concerned with what a tube will do rather than why it does it, but aside from the intriguing idea of "beaming" the electrons, the 6L6 has some highly interesting design features. To put the thing in a nutshell, the new beam power tube, although a tetrode, represents an advance in design which approxi-

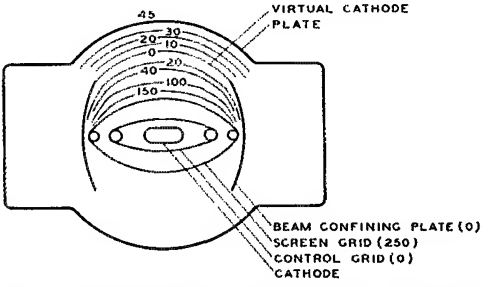
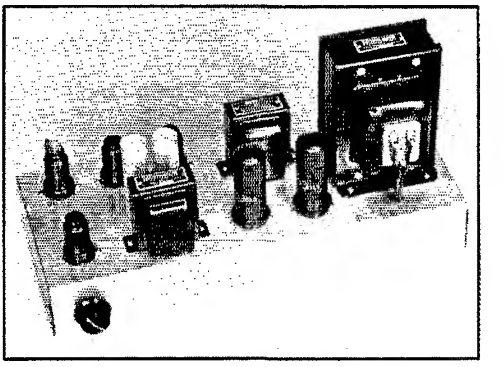


FIG. 1—A TOP VIEW OF THE ELEMENT ARRANGEMENT IN THE 6L6

mates the ideal pentode—one with perfectly straight plate-voltage plate-current characteristics, permitting full utilization of the tube's capabilities before distortion of the output waveshape becomes a factor. The 6L6 is free from secondary plate emission effects to an even greater extent than the suppressor-equipped pentode.

* Assistant Technical Editor.

The element arrangement of the 6L6, as viewed from the top, is shown in Fig. 1. The inner (control) and outer (screen) grids are elliptical in shape. At the ends of the grids are metal plates, internally connected to the cathode, which act as deflectors. Since the deflector plates are at



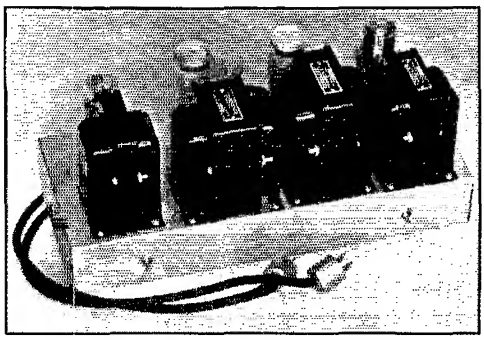
METAL-TUBE SPEECH UNIT WITH PUSH-PULL 6L6 OUTPUT

This four-stage amplifier will deliver an audio output of approximately 50 watts with negligible distortion, in conjunction with the power supply shown in another photograph. The gain is sufficient for the popular diaphragm-type crystal microphone.

zero potential, electrons are not attracted to them but flow to the plate in two wedge-shaped beams. The semi-circular plate sections are the only parts of the plate to receive electrons; the remainder of the plate is useful only as a mechanical support and as a heat radiator. The concentration of electrons into two beams gives extremely high electron density in the space between the active portions of the plate and the other tube elements. The contour lines represent equipotential surfaces within the tube. It will be noticed that the deflector plates are placed so that their edges coincide with a zero-potential surface.

From the side, a cut-away section of the tube would look something like Fig. 2. The control and screen grids have the same number of turns per inch, the screen wires being lined up exactly behind the control-grid wires. "Lining-up" is an innovation in tube design; the reason for it can be explained by reference to Fig. 2. Assuming that the control grid is negative, electrons emitted

from the cathode will be repelled by the negative grid, causing them to be compressed into sheets flowing between the grid wires. The velocity of the electrons carries them on through the screen mesh. Lining-up, plus critical spacing of screen with reference to control grid and plate, makes the screen an effective accelerator, but causes



THE TWO POWER SUPPLIES ARE MOUNTED ON THE SAME TYPE OF CHASSIS AS THE SPEECH AMPLIFIER

One supply, using ordinary receiver components, furnishes plate and filament power for all tubes except the 6L6's. The comparatively heavy drain of the latter is handled by a choke-input plate supply and a special filament transformer.

the screen current to be quite low, since comparatively few electrons strike the screen wires. The overall efficiency of the tube is therefore increased.

After passing through the screen the electrons spread out somewhat as indicated in Fig. 2. The high electron density resulting from beaming causes the formation of an electron barrier in the space between screen and plate, so that secondary electrons are repelled back into the plate. In effect, therefore, there is an electronic suppressor within the tube, its characteristics being such that it offers no impedance to the flow of primary electrons to the plate, but completely prevents secondary electrons from returning from plate to screen. An optical analogy would be a lighted room on a dark night—it is possible to see clearly into such a room from outside, but an observer on the inside looking out can see nothing.

The electronic suppressor, by eliminating the grid mesh of the usual wire suppressor, removes one cause of undesired curvature in tube characteristics. Beaming, in similarly eliminating the distorting effects of grid supporting rods, removes another.

6L6 CHARACTERISTICS

The straight plate-voltage plate-current curves of the 6L6 make the output of the tube remarkably free from high-order harmonic distortion. In comparison with the ordinary pentode plate family, these curves, instead of bending gradually downward at low plate voltages, continue straight until a critical plate voltage is reached, whence they drop off suddenly. The fact that the drop occurs at very low plate voltage accounts for the increased efficiency of the 6L6 over conventional types, since for a given static plate voltage and plate current the tube can be swung over a greater range before distortion starts. The characteristics, however, are still those of a pentode-type tube, with the usual tailing-off of plate current as the grid bias is made more negative. For this reason the second-harmonic distortion is high in a single-tube amplifier, even though the third and higher-order harmonics are negligible. With push-pull, however, the second harmonic is eliminated, leaving an amplifier with substantially no distortion.

A wide range of selection of operating conditions is available to give different power outputs and various amounts of distortion. The single-tube ratings are probably of little interest to amateurs, since the second-harmonic distortion is high. This can be overcome by suitable amplifier design, but as we see it, for the present at least, the real field for this tube in amateur radio is as a modulator of moderate power or as a driver for high-power Class-B modulators. The operating data given below are therefore for two tubes in push-pull.

The heater of the 6L6 takes 0.9 amp. at 6.3 volts. Maximum rated plate voltage is 400; maximum screen voltage, 300. As a push-pull Class-A amplifier the following operating conditions are recommended:

	Fixed Bias	*Self-Bias*
Plate voltage	250	250 volts
Screen voltage	250	250 volts
Grid bias	−16	−16 volts
Peak a.f. grid-to-grid voltage	32	35.6 volts
Zero-signal d.c. plate current	120	120 ma.
Max.-signal d.c. plate current	140	130 ma.
Zero-signal d.c. screen current	10	10 ma.
Max.-signal d.c. screen current	16	15 ma.
Load resistance (plate to plate)	5000	5000 ohms
Max.-signal power output	14.5	13.8 watts
Distortion: total	2	2 per cent
3rd harmonic	2	2 per cent

Several sets of operating conditions may be used with a pair of 6L6's in a Class-AB amplifier. Those following are for excitation without drawing grid current—in other words, no power is required from the preceding amplifier.

Plate voltage	400	400	400	400 volts
Screen voltage	250	250	300	300 volts
Grid bias, fixed	−20	−20	−25	−25 volts
Peak a.f. grid-to-grid voltage	40	40	50	50 volts
Zero-signal d.c. plate current	88	88	100	102 ma.
Max.-signal d.c. plate current	126	124	152	156 ma.
Zero-signal d.c. screen current	4	4	5	5 ma.
Max.-signal d.c. screen current	9	12	17	12 ma.
Load resistance (plate-to-plate)	6000	8500	6600	3800 ohms
Max.-signal power output	20	26.5	34	23 watts
Distortion: total	1	2	2	0.6 per cent
3rd harmonic	1	2	2	0.6 per cent

If grid current is drawn, imposing the requirement that the driver stage be capable of supplying some power, the

following operating conditions are typical:

Plate voltage	400	400 volts
Screen voltage	250	300 volts
Grid bias, fixed	−20	−25 volts
Peak a.f. grid-to-grid voltage	57	80 volts
Zero-signal d.c. plate current	88	102 ma.
Max.-signal d.c. plate current	168	230 ma.
Zero-signal d.c. screen current	4	6 ma.
Max.-signal d.c. screen current	13	20 ma.
Load resistance (plate-to-plate)	6000	3800 ohms
Peak grid input power	180	350 milliwatts
Max.-signal power output	40	60 watts

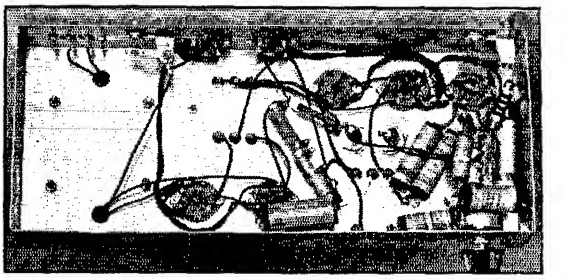
Under these last sets of operating conditions, the distortion will depend primarily upon the driver stage, the distortion introduced by the 6L6's amounting only to about 2 per cent if driver distortion and the effects of resistance in series with the grid circuit are absent. For lowest distortion the effective driver impedance, as looked at from the 6L6 grids, should be low.

The wide range of operating methods makes the 6L6 adaptable to practically any application where audio power outputs upwards of ten watts are required. In fact, tube manufacturers feel that this tube will replace existing power-output tubes in almost all types of broadcast receivers. The high power-sensitivity, the fact that outputs up to 30-odd watts may be secured without grid current, and the triode-like characteristic of being quite tolerant of plate-loading, likewise make the tube an ideal one for amateur speech amplifiers and modulators.

A PRACTICAL AMPLIFIER

The 6L6 speech-amplifier unit and accompanying power supply shown in the photographs can be considered to be a general purpose affair, in that substitution of a suitable output transformer makes it adaptable both as a complete modulator and as a driver for Class-B units employing anything up to a pair of 204-A's. The voltage gain to the grids of the 6L6's is more than sufficient for crystal microphones of the diaphragm type, a peak input of about 0.005 volt being sufficient to drive the final tubes to full output. The input stage uses a 6J7 (equivalent to the 57 or 6C6) pentode; this tube is resistance-coupled to a 6C5 triode intermediate amplifier. The driver consists of a pair of 6C5's in push-pull, transformer-coupled to the preceding stage. The 6C5's are capable of delivering sufficient power for excitation of the 6L6 grids. The input transformer, T_2, is specially designed for the purpose. The 6L6 output transformer, T_3, also is a special job, arranged with a tapped secondary to work into loads of 2500, 5000 or 7500 ohms for modulation purposes; its turns ratio is such that the plate-to-plate load on the 6L6's is 3800 ohms.

The low-level speech-amplifier section needs no particular comment, since it is practically identical with several layouts described previously in *QST*. It occupies the left-hand section of the chassis; the bottom view indicates that the various resistors and condensers are placed in the most convenient locations. The design of the whole unit is, in fact, perfectly straightforward. The microphone jack is on the back of the chassis near the 6J7 tube; the first 6C5 is at the front left-hand corner, with the gain control conveniently situated. To its right is the single-tube to push-pull coupling transformer; back of the coupling transformer are two electrolytic bypasses, C_6 and C_7, followed by the push-pull 6C5's. The input and output transformers, as well as the 6L6's, are readily identified. The jack for measuring 6L6 plate current is mounted on the back of the chassis, along with a stock two-terminal strip for the output.



BOTTOM VIEW OF THE SPEECH AMPLIFIER CHASSIS
A discussion of the layout will be found in the text.

Suitable power supply for the amplifier presents a few problems. Although the tubes operate at low voltage, the high-power output is not obtained for nothing—the plate current necessarily is high. Theoretically, it is necessary to have a plate supply for the 6L6's capable of delivering better than 200 ma. at 400 volts; furthermore, this supply should have good regulation if the voltage is to stay within safe limits for electrolytic filter condensers. Ordinary broadcast replacement transformers are out of the question. After some perusing of catalogs, it was decided to feed the outfit with two power supplies, one for the 6L6 plates and the other for everything else, including the 6L6 screens. This made possible the elimination of a voltage divider on the 400-volt supply, thus lightening its load. The final arrangement uses a broadcast transformer rated to give 300 volts at 55 ma., with all tubes except the 6L6's getting their filament power from this transformer; a second plate transformer rated to give 400 volts (with a choke-input filter) at 100 ma. continuously and 200 ma. intermittently; and a third transformer to heat the filaments of the 6L6's and an 83 rectifier. An ordinary condenser-input filter with one choke (this choke is mounted underneath the power-supply chassis) is used on the 300-volt supply. The 400-volt supply has choke input, with the two sections of a double-8 electrolytic condenser in parallel across the output.

The fixed bias for the 6L6's is obtained from the 300-volt supply. Reference to Fig. 4 will show that there is no ground on the negative side of the 300-volt supply (outlet A). The total current from this supply is made to flow through the right hand section of R_{15} (Fig. 3) to ground; by means of the adjustable tap on R_{15} the bias voltage is set at 25 volts. R_{14} is a bleeder resistor to load the 300-volt transformer to full capacity. It is desirable to do this so that the current through R_{15} will be as heavy as possible, thus maintaining the bias fairly constant even though grid current flows. R_{13} drops the voltage to the proper value for the speech-amplifier plates.

The power terminals on both speech and power-supply units are four-prong tube sockets. Connections are made by means of four-wire cables with plugs at each end.

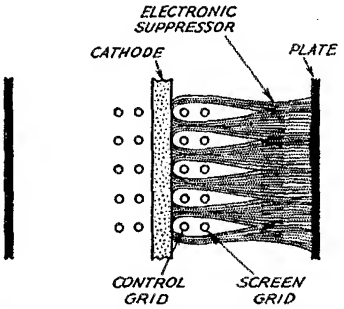


FIG. 2—VERTICAL SECTION OF THE 6L6, SHOWING THE FORMATION OF THE ELECTRONIC SUPPRESSOR

be exactly 300 volts, since the plate current is quite sensitive to changes in screen voltage—considerably more so than to changes in plate voltage.

With the values given in the circuit diagrams, the whole system is perfectly stable (a ground connection must be used, of course) and the hum level is negligible. Should the hum increase perceptibly when the microphone plug is inserted, it will be necessary to shield the grid cap of the 6J7.

Measured output of this combination at the point just below where perceptible distortion begins was approximately 45 watts. This represents a steady-state condition with a sine-wave signal, however, and thus put a heavy load on the power supply, the output voltage of which dropped to between 350 and 375 volts. Power-supply regulation, together with the fact that

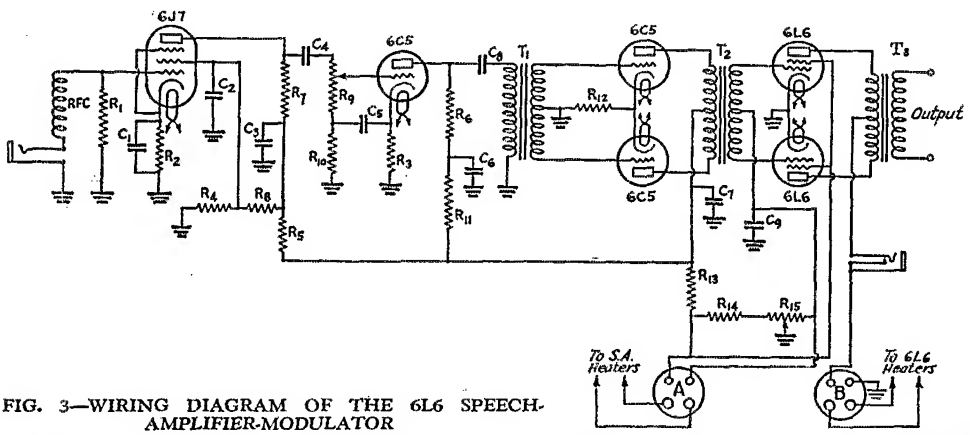


FIG. 3—WIRING DIAGRAM OF THE 6L6 SPEECH-AMPLIFIER-MODULATOR

C_1—10-μfd., 25-volt electrolytic.
C_2, C_3—2-μfd., 200-volt electrolytic.
C_4—0.1-μfd. paper, 400-volt.
C_5—0.5-μfd. paper (or larger).
C_6, C_7—4-μfd., 400-volt electrolytic.
C_8—0.25-μfd. paper, 400-volt.
C_9—25-μfd. electrolytic, 50-volt.
R_1—5 megohms, ½ watt.
R_2, R_3—3500 ohms, ½ watt.
R_4, R_5, R_6—50,000 ohms, ½ watt.
R_7, R_8—0.25 megohm, ½ watt.
R_9—0.5-megohm volume control.
R_{10}—100,000 ohms, ½ watt.
R_{11}—10,000 ohms, ½ watt.
R_{12}—500 ohms, ½ watt.
R_{13}—2500 ohms, 1 watt.
R_{14}—15,000 ohms, 10-watt.
R_{15}—1000 ohms, 10-watt.
T_1—Audio transformer, single plate to push-pull grids, ratio 3:1 (Thordarson T-5741).
T_2—Input transformer for coupling push-pull 6C5's to 6L6 grids (Thordarson T-8459).
T_3—Output transformer, 3800-ohm load, plate to plate, see text (Thordarson T-8470).

A few words about operation: Provided the values given are followed, the only adjustment to be made is that of the bias on the 6L6's. Preferably, this should be done with the aid of a high-resistance voltmeter, with everything except the 400-volt plate transformer turned on. However, if no such voltmeter is available, a method which works about as well is to set the tap on R_{15} so that the plate current to the 6L6's is slightly over 100 ma. If this latter scheme is to work, however, it is essential that the screen voltage

the ratings in the tables previously given are for the tubes only and do not include unavoidable losses in the output transformer, probably accounts for the difference between actual measured output and the theoretical 60 watts which should be available. Observation with the aid of the oscilloscope showed that with voice input the average plate current rises only to about 130–140 milliamperes to give the same peak output. It is safe to say, therefore, that the output for voice work is in the vicinity of 50 watts; certainly there

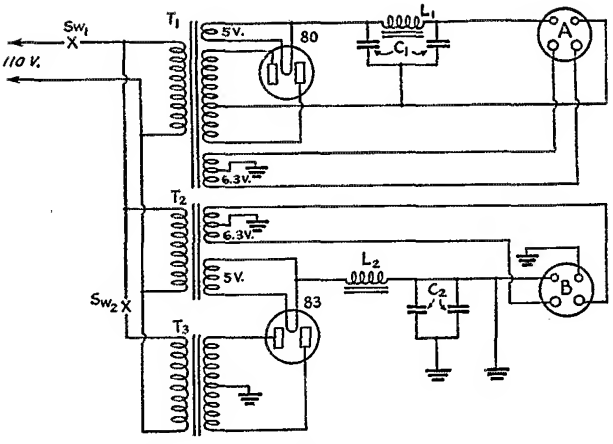


FIG. 4—DIAGRAM OF THE POWER-SUPPLY UNIT

T_1—Receiver power transformer; high-voltage winding to deliver app. 325 volts d.c. at 50 ma.; 5-volt, 2-amp. rectifier winding; 6.3-volt, 1.5-amp. filament winding (Thordarson T-7078).
T_2—Filament transformer, 5 volts at 3 amps., 6.3 volts at 2 amps. (Thordarson T-7984).
T_3—Plate transformer, to deliver 400 volts at 100 ma. through choke-input filter (Thordarson T-5503).
L_1—50-ma. filter choke, 30-henry commercial rating.
L_2—Input choke, 26 to 12 henrys, 250 ma. (Thoradson T-7551).
C_1, C_2—Double 8-μfd. dry electrolytics, 450-volt.
SW_1, SW_2—S.p.s.t. toggle switch.

is plenty of audio power to modulate a Class-C amplifier running with 100 watts plate input.

It is interesting to note that with the same 3800-ohm load impedance it is possible to secure about 20 watts of audio without running into grid current on the 6L6's. The distortion under these conditions is less than 1 per cent. A pair of 6L6's is thus about equivalent to a pair of 46's in Class-B—but can be excited by a voltage amplifier, whereas the 46's would require a driving source capable of delivering a watt or so to the grids.

DIXIE JONES' OWL JUICE

AMATEUR Radio Club meetings ain't run right. I ain't been to um all everywhere but what I been to makes me sick. I go to one of um hopin' to see somebody I know and clear hooks with him or meet some mug I ain't met yet and git acquainted with him and see what he looks like and what's goin' on inside of his conk, and vice versy, and what happens? Wye, doggone it, everybody has to set around on a hard chair and squirm for two hours keepin' still a listenin' to a long winded "business meetin'" that could just as well have took up half the time it did, or less, as it don't amount to a hill of beans anyway. And then they have some guy with long hair in from the outside to talk about "parasitic oscillations" or sumpn and he rambles on for another hour and a half over everybody's head and nobody has the nerve to throw a chair at him. He finally exhausts himself, his subject and his audience and sets down and the club president reluctantly turns everybody loose. By that time it's late, but you still can't visit with nobody yet as you got the refreshments to eat, which is a winnie and a bottle of bellywash, and you can't talk to nobody with your face full of winnie. So what? Wye, you gobble this puppy quick and shove off home and when you git there you git a growl from the ever loving OW for checking in later than you led her to believe you would, and you crawl into the hay and snooze off still wondering who was the strange hams at the meeting and promising yourself that some day soon you'll try to get around to see some of the old friends you saw there and have a chat with them. You can't do it at a radio club meeting. They take up all the blame time with "old business" and "new business" and this guy "makes a motion" and that guy "makes a motion" and what they need is some big guy about seven feet high to git up and make a motion with a club and scatter these half dozen guys that's going to run the club anyway and might as well do it some other time when they're off by theirselves and not botherin' nobody. Shucks. I got a blame good notion to git me up a radio club of my own and run it right. If I did I wouldn't have no officers and no committees and no minits of the last meeting and rising votes of thanks and "the Chair recognizes the gentleman from McDaniel Street" and all such time-killing, ham-squelching tommyrot. I'd just lettum in and turnum loose. I betchy they'd like it.

—W4IR of the "Dixie Squinch Owl"

Strays

When you want to keep your schedules at a "borrowed" station while away from home traveling or visiting, why not take along your own crystal? It automatically puts you on the frequency known to your correspondent, right at the old pencil-mark on his dial. He won't even have to know that you're away from home—you have his ear when he hears himself called on the old familiar frequency at the appointed hour.

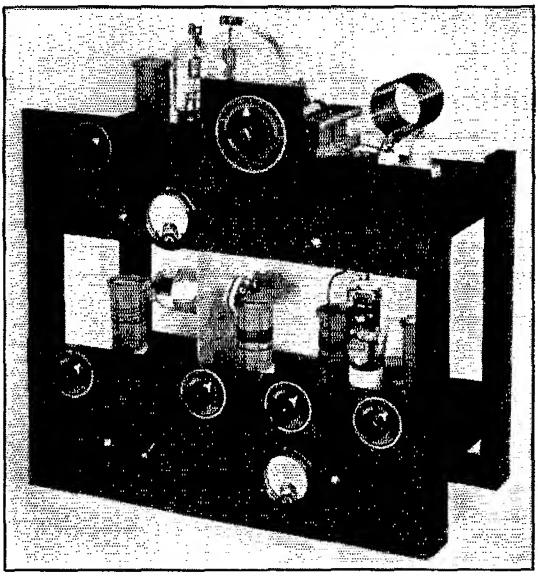
A High-Performance Three-Stage Transmitter With Improved Tri-Tet Exciter

100- to 200-Watt Output on Four Bands with a Single Crystal

By Byron H. Goodman,* W1JPE

THE present-day crystal-controlled transmitter of medium power usually consists of three stages: oscillator, doubler or buffer, and final amplifier. With a 3.5-mc. crystal, good results can be obtained on 3.5 and 7 mc.; getting to 14 mc. involves a few tricks, and 28-mc. operation is almost out of the question unless a 7- or 14-mc. crystal is used. Obviously the weak link is in efficient frequency multiplying.

Looking over the many schemes for efficient frequency multiplying proposed in the past, the one that seemed to show the greatest possibilities was the regenerative frequency multiplier utilizing feedback to the screen grid of a pentode.[1] Further consideration suggested the possibility of feeding out-of-phase energy back to the suppressor grid instead of the screen grid, since the suppressor requires much less voltage swing to modulate completely the electron stream. The idea looked like a good one, for by increasing the feedback to the point where the plate and suppressor grid portion of the tube oscillated, the excitation would probably lock the output frequency, and a simple form of locked oscillator would be had.



THE FOUR-BAND THREE-STAGE TRANSMITTER

A 3.5-mc. crystal is used for operation on four bands, including 28 mc., without doubling in the final amplifier.

A hastily constructed breadboard arrangement was used to try the system. An RK25 was used as in Fig. 1, excited by another RK25 as a Tri-tet oscillator using a 3.5-mc. crystal, the plate being tuned to 7 mc. Quadrupling to 28 mc., the system showed promise but the output was inadequate to excite fully a pair of Eimac 35T's, the goal. Even adjusting the feedback to the point where the plate and suppressor grid portion of the tube oscillated by itself did not supply enough output, even though the frequency was stabilized perfectly by the 7-mc. excitation. So hopes for this particular short cut went bust.

Then another idea suggested itself. It was asking a little too much of a frequency quadrupler to furnish 12 watts or so on the fourth harmonic, when its fundamental output is ordinarily not more than 16 watts or so. But if it were possible to quadruple efficiently in the *oscillator* and obtain two or three watts of output, doubling in the second tube (a reasonable procedure) should furnish the necessary 28-mc. output. The regular Tri-tet circuit, shown in Fig. 2, was modified to include suppressor-grid feedback as shown in Fig. 3. The fourth harmonic output wasn't what had been expected, and again high hopes crashed with a dull thud. The thud woke up George Grammer, who had been working peacefully in the corner, and he was told of the scheme that looked fine on paper but wouldn't work as had been anticipated. He suggested that a higher capacity in the cathode tank circuit, to form a lower impedance return path for the harmonic energy, might help. A 250-$\mu\mu$fd. fixed condenser was shunted across the cathode tuning condenser C_1, and the coil pruned until the crystal again oscillated. Here was something! Output on the second harmonic was higher, and the fourth harmonic output was ample to drive the second RK25 as an effective doubler to 28 mc!

* Assistant Secretary, A.R.R.L.

[1] Keen, "An Effective Power-Type Frequency Multiplier," *QST*, March, 1932.

Further tests on the new circuit disclosed that it was quite tolerant as to the ratio of feedback turns to tank turns, one-third to one-fourth being about optimum. When using a 3.5-mc. crystal and quadrupling to 14 mc., the suppressor coil was brought directly to ground; but when a 7-mc. crystal was used quadrupling to 28 mc., an increase in output was obtained if the suppressor grid was made 30 or 40 volts positive by grounding the cold side of the feedback coil through a condenser and tapping on to a voltage divider. Of prime importance is the C/L ratio of the cathode tank circuit; the larger the capacity is made, the better the harmonic output. (The necessity for reasonably high C/L ratio in the cathode of the conventional Tri-tet circuit has been stated repeatedly in *QST*, and most of the mediocre results reported are traceable to failure to observe this important specification.)

Some may ask why tubes of the 59 class were not used, as with the early Tri-tet circuit. The answer is simple. When the Tri-tet was first developed no special transmitting type pentodes were obtainable; but with tubes of the RK25 and 802 type available, with their improved characteristics and increased power, full advantage may be taken of the capabilities of this oscillator circuit.

EXCITER COIL DATA

Final Frequency	L_2	L_3	L_4	L_5	L_6
3.5 and 7 mc...	23 turns 1½" long	shorted out	23 turns 1½" long	23 turns 1½" long	21 turns 1½" long
7 and 14 mc...	8 turns ½" long	4 turns ⅝" long	9 turns ⅝" long	10 turns 1" long	9 turns 1" long
14 and 28 mc...	Same as above	Same as above	Same as above	4 turns ⅞" long	3¾ turns ¾" long

L_1 is 9 turns 1" long.

FINAL TANK COIL DATA

L_7	*Turns*	*Wire*	*Diameter*
3.5 mc.....	32	No. 16	2½"
7 mc.....	24	No. 16	2¼"
14 mc.....	12	No. 14	2¼"
28 mc.....	6	No. 12	2¼"

All coils 3" long.

TUNING COMBINATIONS

Final Output	L_2	L_4	L_5	L_6	L_7
3.5 mc.*....	3.5 mc.	3.5 mc.	3.5 mc.	3.5 mc.	3.5 mc.
7 mc.....	3.5 mc. or 7 mc.	3.5 mc. or 7 mc.	7 mc.	7 mc.	7 mc.
14 mc.....	7 mc. or 14 mc.	7 mc. or 14 mc.	14 mc.	14 mc.	14 mc.
28 mc.....	14 mc.	14 mc.	28 mc.	28 mc.	28 mc.

* For 3.5 mc., L_1 is shorted.

A SIMPLE 150-WATT TRANSMITTER

The average operator of to-day does not usually confine his operating to any one band but likes to switch from band to band, taking full advantage of conditions. Modern receivers are designed for quick band-changing, and the recent influx of band-switch transmitters definitely shows the trend. However, there are still many who steer clear of band-switching, feeling that possible loss in efficiency does not fully compensate for the facilitated band changing. Usually there is no objection to switching in the exciter unit, and many transmitters have been built using this scheme. Another method is to use condensers large enough to tune to two bands with one coil. The latter method is used in the transmitter to be described. It was first tried using 100-$\mu\mu$fd. tank condensers, but the high input and output capacities of the pentodes made it impossible to tune to the extreme limits of any two bands, although a single

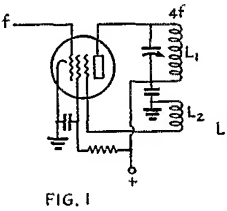


FIG. 1

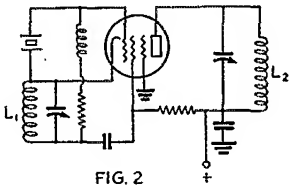


FIG. 2

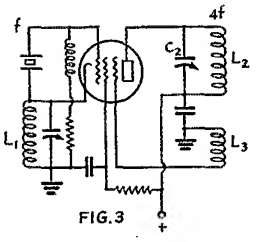


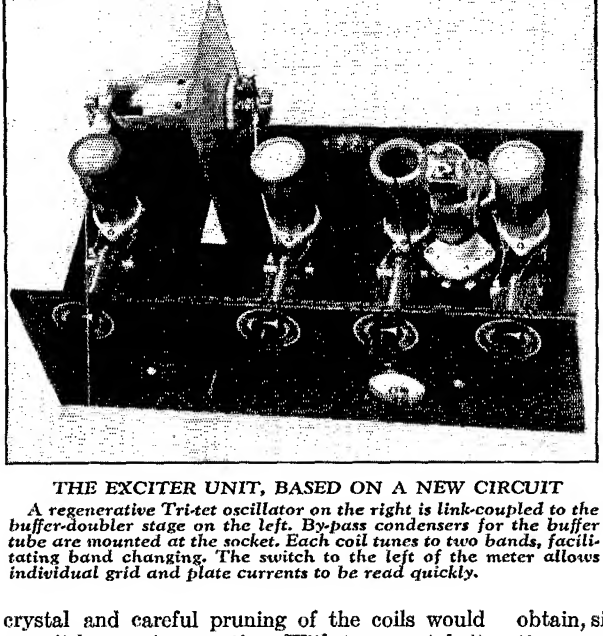
FIG. 3

FIG. 1—REGENERATIVE QUADRUPLING AMPLIFIER USING SUPPRESSOR-GRID FEEDBACK

FIG. 2—CONVENTIONAL TRI-TET CIRCUIT

FIG. 3—THE REGENERATIVE TRI-TET CIRCUIT

It is seen that it is logically developed from Figs. 1 and 2. Efficient quadrupling in this oscillator circuit permits the elimination of several tubes and tuned circuits in multiband transmitters.



THE EXCITER UNIT, BASED ON A NEW CIRCUIT

A regenerative Tri-tet oscillator on the right is link-coupled to the buffer-doubler stage on the left. By-pass condensers for the buffer tube are mounted at the socket. Each coil tunes to two bands, facilitating band changing. The switch to the left of the meter allows individual grid and plate currents to be read quickly.

lower shelf; it consists of an RK25 or 802 regenerative Tri-tet oscillator link coupled to an RK25 or 802 doubler-buffer stage. The oscillator can work as a straight 3.5-mc. pentode oscillator by shorting the cathode condenser, or 7- or 14-mc. output can be obtained in the plate circuit when using the Tri-tet circuit. The second pentode can work as a straight-through amplifier on any of the three lower frequency bands, or as a doubler to 28 mc. With 550 volts on the plate of the buffer, adequate output is obtained on all bands to permit the final amplifier to be driven to full Class-C with 200 watts input, the nominal rating for full modulation. If c.w. operation is desired, 1500 volts at 200 milliamperes is no excessive burden for the two Eimac 35T's comprising the final amplifier.

It might be well to explain why the final amplifier was built using the tubes in parallel instead of the more general push-pull arrangement. A balanced arrangement using a 140-$\mu\mu$fd. condenser in the grid circuit would be difficult to obtain, since a split-stator condenser of that effective capacity would be all out of proportion. The possibility of undesirable harmonic output with crystal and careful pruning of the coils would permit harmonic operation. With two crystals it is not possible. Consequently 140-$\mu\mu$fd. condensers were used, which allowed full coverage with ease. The final tank coil was made plug-in, it being felt that this would make for best efficiency. A transmitter resulted that requires only one plug-in coil range when shifting from one band to an adjacent one.

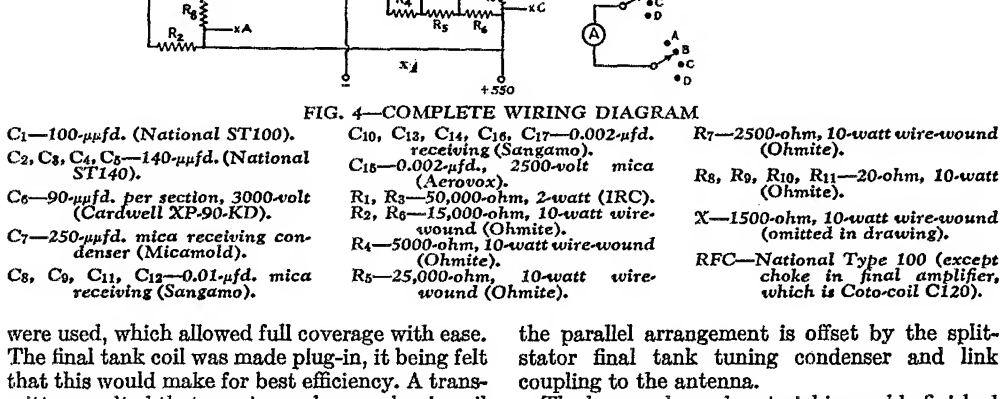


FIG. 4—COMPLETE WIRING DIAGRAM

C_1—100-$\mu\mu$fd. (National ST100).

C_2, C_3, C_4, C_5—140-$\mu\mu$fd. (National ST140).

C_6—90-$\mu\mu$fd. per section, 3000-volt (Cardwell XP-90-KD).

C_7—250-$\mu\mu$fd. mica receiving condenser (Micamold).

C_8, C_9, C_{11}, C_{12}—0.01-μfd. mica receiving (Sangamo).

C_{10}, C_{13}, C_{14}, C_{16}, C_{17}—0.002-μfd. receiving (Sangamo).

C_{15}—0.002-μfd., 2500-volt mica (Aerovox).

R_1, R_3—50,000-ohm, 2-watt (IRC).

R_2, R_6—15,000-ohm, 10-watt wire-wound (Ohmite).

R_4—5000-ohm, 10-watt wire-wound (Ohmite).

R_5—25,000-ohm, 10-watt wire-wound (Ohmite).

R_7—2500-ohm, 10-watt wire-wound (Ohmite).

R_8, R_9, R_{10}, R_{11}—20-ohm, 10-watt (Ohmite).

X—1500-ohm, 10-watt wire-wound (omitted in drawing).

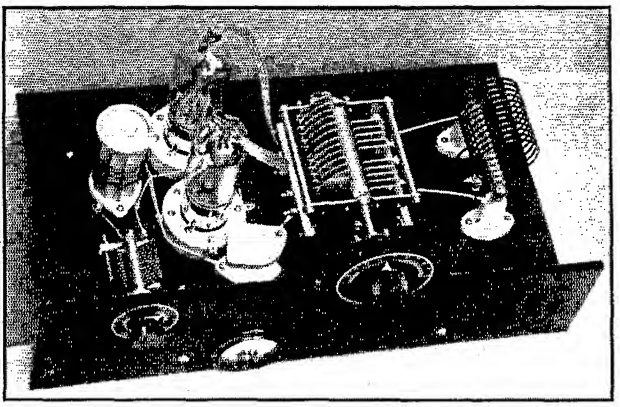
RFC—National Type 100 (except choke in final amplifier, which is Coto-coil C120).

As can be seen in the illustration of the complete transmitter, the construction is a modified form of open rack. The exciter unit occupies the parallel arrangement is offset by the split-stator final tank tuning condenser and link coupling to the antenna.

The base and panel material is crackle-finished tempered "Masonite," a convenient material because of the ease with which it can be worked and the pleasing effect the finished product presents. The panels are fastened securely to the bases by metal brackets, thus forming a complete

unit that may be slid into place and quickly removed if a change is to be made. A solid front panel was not used because it would then have been an awkward process to reach around and plug in coils. The frame is built of 1-inch by 2-inch pine strips, fastened together with screws and finished with flat black paint. The dials are fastened to the panel with Duco cement.

The construction of the transmitter is conventional throughout. Radio frequency wiring is carried above the bases; power supply leads and by-pass condensers are mounted under the base except in the case of the buffer stage with its horizontally-mounted tube, in which case the by-pass condensers are mounted right at the socket. The cathode tuning condenser has a 250-$\mu\mu$fd. condenser shunted across it, to add the requisite high capacity so essential to efficient operation.



THE FINAL AMPLIFIER, WITH PARALLEL 35T'S

Inputs up to 300 watts can be applied from 3.5 to 30 mc. The neutralizing condenser is homemade, since but few commercially available condensers have the low capacity required to neutralize these tubes

The plug-in coils are wound on four-prong forms, except the plate coil of the oscillator, which is wound on a six-prong form. It will probably be found that a little juggling of coil turns will be necessary to hit the bands just right, but this procedure is followed in most cases anyway. An absorption-type wavemeter will be found invaluable in lining up the coils, since it is quite easy to mistake harmonics and find yourself operating on an odd frequency midway between two of the legitimate amateur bands.

The neutralizing condenser for the final amplifier is made from two pieces of aluminum mounted on small stand-off insulators. Once adjusted, it need not be touched. The coil for the final tank circuit can be whatever you are used to using; in this case one of the many excellent "air-wound" coils now available was used. It is plugged into two stand-off insulators equipped with suitable jacks. The radio frequency choke is mounted directly under the jack, and at right angles to the tank coil. A flexible lead from the center of the coil is plugged into a jack set in the base, feeding the plate power to the final tubes.

With the set constructed, and the coils wound and pruned to the proper value as checked by the wavemeter, 550 volts on the plate of the buffer tube should give 50 milliamperes or more grid current to the final. Properly loading the final stage so that it draws 200 milliamperes with a voltage of 1500, the plates of the tubes should show a slight cherry-red color, indicating normal operation. The tubes are designed to run showing a slight color at their normal rated dissipation of 35 watts each.[2] For 'phone operation, the plate voltage should be reduced to 1000, with a plate current of 200 milliamperes.

[2] Operating notes on the 35T, *QST*, May, 1936.

A New "Cold Dry" Crackle Finish

By J. P. Summer,* W3DHJ, and R. W. Emmott,** W3ESJ

AMATEUR radio has reached the point where the station equipment is no longer a haywire conglomeration of parts. It is every operator's desire to make his station as nearly commercial looking as possible. The adoption of rack and panel construction has become widespread, and for those who build their own equipment the method of finishing has been a difficult problem. Manufacturers of radio equipment use a finish which is baked on. The successful application of this finish requires more skill and knowledge than most amateurs have, and equipment which they generally do not possess. There are a number of enamels and lacquers on the market which produce a very beautiful finish, when applied with the proper care. But they are not sufficiently simple for any one who is not acquainted with the various methods of handling paints. Therefore the results are not consistent.

A product known as "Air Dry Shrivel," manufactured by the Murphy Varnish Company, of Newark, N. J., has been developed for those who want a shrivel finish but do not have facilities for baking. This product has been made as fool-proof as possible; it can be brushed or sprayed on, and will produce a finish like that on most commercial apparatus.

Some experiments will have to be made to determine the degree of shrivel desired, as it is controlled by the thickness of the coat of enamel. Also the depth of color must be ascertained, as the shrivel enamel is not as opaque as ordinary enamels. If a very jet black is to be obtained, it will

(*Continued on page 90*)

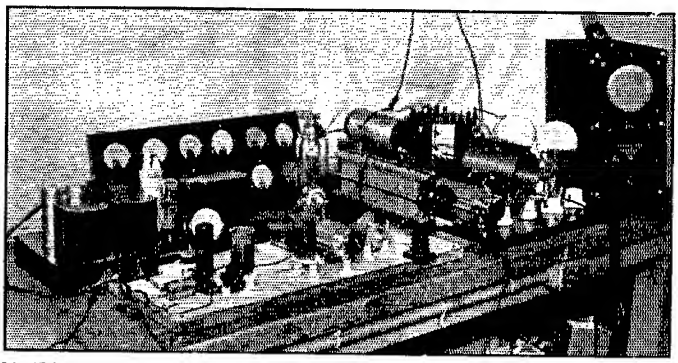
* Watnong Drive, Morris Plains, N. J.
** 17 Headley Rd., Morristown, N. J.

The 6L6 Beam Power Tube as a High-Output Crystal Oscillator

By Frank W. Edmonds,* W2DIY

THE advent of a new tube always kindles the fire of conjecture as to its adaptability to transmitter oscillator design, even though it may have been intended for other uses. The new 6L6 "Beam" power tube, with its high-power sensitivity and high order of efficiency, appears to be exceptionally inviting. Experimental work with metal tubes as crystal oscillators have shown that the metal types were good oscillators. The new 6L6 seemed even more inviting than any of the pentode types which had originated for audio use and had been harnessed, with good results, as r.f. oscillators. Published data on the 6L6 tube indicate that it possesses many of the requisite qualifications for crystal oscillator service; namely, ease of excitation (high-power sensitivity), high efficiency, high-power output, and, most important of all, a high order of a second harmonic output. The first of these features means that high output can be obtained with a minimum amount of work on the part of the crystal. The second feature promises adequate excitation for succeeding power amplifier stages; and, since most harmonic operation of transmitters is accomplished by doubling, the third feature means that the excitation to a succeeding doubler stage should be rather good.

When put to the test of actual operation, the tube even exceeded expectations. As shown by the table, the efficiency over a wide range of applied voltages held close to 50% and the power output exceeded that of any of the smaller pentodes which have been used for this service. The results shown by this table are even more interesting when you consider the fact that they were obtained with a 40-meter crystal which was a notoriously poor performer in any of the conventional circuits. High-power output from crystal oscillators, on the fundamental and second harmonic, has always been very desirable from the standpoint of simplifying transmitter design. The 6L6 is very well adapted to meet the requirements of this type of service and is an extremely good performer. It will be noted, from a study of the table, that several features of the performance of this new tube stand out and set it in a class by itself among oscillators.



THE EXPERIMENTAL 200-WATT TRANSMITTER SET-UP, SHOWING THE CRYSTAL OSCILLATOR AT THE LEFT

The dummy load used for the r.f. power measurements is at the extreme right.

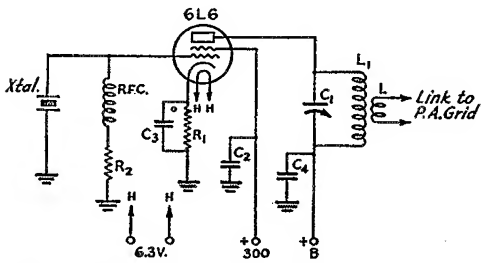


FIG. 1—CIRCUIT OF THE EXPERIMENTAL 6L6 CRYSTAL OSCILLATOR

L_1—Usual coil to suit the crystal frequency.
C_1—100 μμfd.
C_2, C_3, C_4—0.1 μfd.
R_1—400 ohms.
R_2—10,000 ohms.

Now, let us consider the circuit and a few precautions to be taken, in order to realize the full possibilities of this new tube. Because of the effect of the screen voltage on the power output and the power-handling capabilities of the tube, it will pay to use a power supply of good regulation and ample current capacity. It is always best not to supply other stages from this power supply.

Referring to Fig. 1 it will be noticed that the screen voltage is taken directly from the power

* United Transformer Corporation, 76 Spring St., New York City.

supply bleeder, instead of through the usual dropping resistor. This arrangement permits keying of the oscillator for break-in c.w. operation, "push-to-talk" for 'phone operation and also provides a very useful means of adjusting the power output of the oscillator over a wide range.

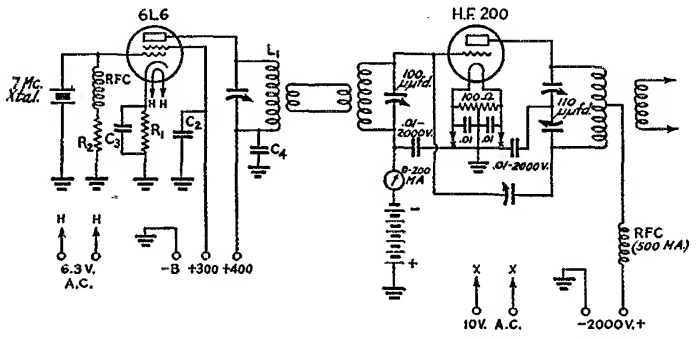


FIG. 2—CIRCUIT OF THE EXPERIMENTAL 200-WATT TRANSMITTER USING THE 6L6 CRYSTAL OSCILLATOR TO DRIVE A HF 200 POWER AMPLIFIER AT 7 MC.

By this time you are probably wondering about the effect of the metal shell on the performance of the tube. The writer worried a little about that point also, but found that it did not interfere with the tube's performance *if it was left floating.* The tube will work with the shield grounded in the usual manner, but is more stable and gives more power output if the shield is left ungrounded. It was used, in one laboratory set-up, as a coupling condenser to excite a succeeding pentode buffer stage, thus doing away with the usual coupling condenser. It is best, however, to link-couple the plate tank to the next stage in order to realize the maximum output from the oscillator.

Fig. 2 and the accompanying photograph illustrate an experimental set-up indicating the possibilities of this new tube. The 6L6 oscillator is shown driving an HF 200 at 7 mc. The results were very gratifying. With only 1600 volts on the plate of the HF 200, an output of over 200 watts was obtained in a dummy antenna. This two-stage set-up would be a nice rig for c.w. work. For a 'phone transmitter a buffer stage should be incorporated to minimize the effect on the oscillator of load variations in the modulated stage.

Fig. 3 illustrates a simple method of determining, with a fair degree of accuracy, the power output of any r.f. set-up with a dummy antenna. A tuned tank of appropriate size is link-coupled to the r.f. source to be tested, and a bank of lamps tapped across a few of the turns of the tank. A little experiment will enable the operator to obtain a proper reflected load to the tube. A light intensity meter (photronic cell) is used to measure the brilliancy of the lamps. Leaving the lamps and light meter in the same positions, the line feeding the lamp bank is switched to a 60-cycle source and the input voltage adjusted to give the same illumination as indicated by the light meter. The product of the voltage across the lamps and the current then gives us the power output of the apparatus under test. These measurements would be difficult to make at radio frequencies, but are easy at 60 cycles and the error is much less than it would be were the measurements attempted with an r.f. instrument.

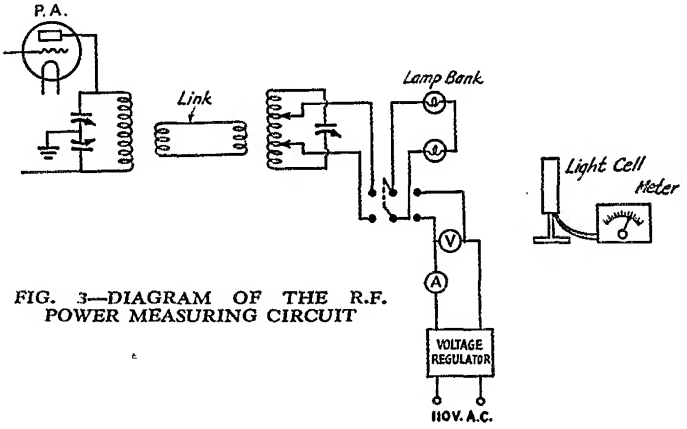


FIG. 3—DIAGRAM OF THE R.F. POWER MEASURING CIRCUIT

CRYSTAL OSCILLATOR PERFORMANCE DATA

Plate Volts	*Screen Volts*	*Plate Current*	*Plate Input, Watts*	*R. F. Power Output, Watts*	*Plate Efficiency*
300	150	50 ma.	15	8	53.3%
380	180	65	24.7	11.5	46.6
380	200	75	28.5	13.5	47.3
385	240	80	30.8	16.5	53.5
385	260	120	46.2	22	47.7
425	285	165	70.1	36.2	51.5

Since this new tube has proven to be such a good performer, the way seems open to the design of compact metal tube transmitters of high efficiency and high-power output with low voltages. It seems especially desirable for portable transmitter use, as well as for a compact high-power exciter for larger transmitters.

Fourth Annual A.R.R.L. Field Day Contest to Test Portables

June 6th–7th

IN communication emergencies *operating ability* is a necessity. It is developed by practice at times before emergencies develop! To "be prepared" also requires that the equipment be at hand, and the operator know what he will do when the power goes off. Effective arrangements are generally developed beforehand. In fact the A.R.R.L. Emergency Corps is dedicated to the fulfillment of a preparedness program. The Annual Field Day is open to every W/VE amateur, and is, in turn, dedicated to the setting up and testing in actual operation apparatus that will function in a reliable manner if and whenever needful.

The Field Day is also the annual event which combines an outing, with the opening of the season for outdoor radio activities. Starting Saturday, June 6th (4 p.m. local time) and ending Sunday, June 7th (7 p.m. local time) all U.S.A. and Canadian station owners are invited to schedule field radio-operating activities. The operation of portable transmitters and receivers afield is enjoyable; in addition it facilitates operator preparation to render constructive service in time of emergency; it encourages the development of equipment suitable for operation independent of interruptions of commercial power sources suitable for emergencies. *Only portable stations, actually operated in the field (away from the "home" address) are eligible to submit field-day scores.*

The object is for each "portable" station to work as many other amateur stations as possible—each different station counting *one point* toward a score. But one contact per station counts, of course. These stations may be locals, fixed stations, other portables, or foreign amateur stations. Any or all amateur frequency bands may be used, voice or c.w. telegraph likewise. The general call: (c.w.) "CQ FD" or (phone) "CQ FIELD DAY." Advance entry is not required to take part in the Field Day.

All points must be made in the contest period given above. The log of operation, claimed score, and data on power and frequency band used for each contact should be sent in promptly at the conclusion of the test. Please note what was used as a source of plate and filament power, along with the "watts input" to final stage, too.

Special credits: Scores may be multiplied by 2 if either receiver or transmitter is independent of commercial power supply, by 3 if both transmitter and receiver are supplied from an independent local source rather than from public mains. The following additional score multiplier will be used to give all stations an equal chance. If the power input to the final stage (plate current times plate voltage—$E \times I$) is:

(a) Up to and including 20 watts—multiply score by 3.

(b) Over 20, and up to 60 watts—multiply score by 2.

(c) Over 60 watts—multiply score by 1.

To comply with F.C.C. regulations for portable station operation, licensees in the U.S.A. have only to observe the instructions of pars. 387 and 384 as respects advance notification of the locations in which the portable will be operated to the Inspector-in-Charge of the district, and as regards proper station identification. In the U.S.A. not only 28- and 56-mc. band portable work is permissible, but operation in any amateur band. In Canada the regulations permit portable sets to be operated *only* for 28–30 mc., 56–60 mc., or 400–401 mc. unless application to the Department of the Marine to secure the special permission necessary for portable work in other bands is made.

The League's affiliated radio clubs are all invited to encourage their members to build portables, and to arrange special Field Day activities for June 6th and 7th. Get together with your local ham club in plans for work with portables on these dates if you can. Every amateur is invited to take part, whether or not able to participate in club plans. Your portable transmitter can be a source of great pleasure for the whole summer season. Get it working now. Test it in the Field Day plans and let us have your report. Take it to the mountains or seashore later and make your summer complete. Keep an operative portable at hand all the year, so it will be where you can put it to work promptly in the event of disaster or public emergency. Don't forget to send your results for the report in *QST*—a postal card or letter will be most welcome, and please add any suggestions for the next Field Day. Ask for the application forms for membership in A.R.R.L.'s Emergency Corps at any time, if qualified and interested.

—*F. E. H.*

Amateurs Carry On

More Emergency Work Finds Hams On the Job

By Clinton B. DeSoto*

DURING the hectic months of March and April, 1936, amateur radio added as many leaves to its laurel crown as in many a year before. Hundreds of amateurs in seventeen states participated directly in the primary emergency work created by flood and tornado; other thousands in all parts of the country assimilated their traffic, making deliveries with an unusually high order of accuracy and reliability.

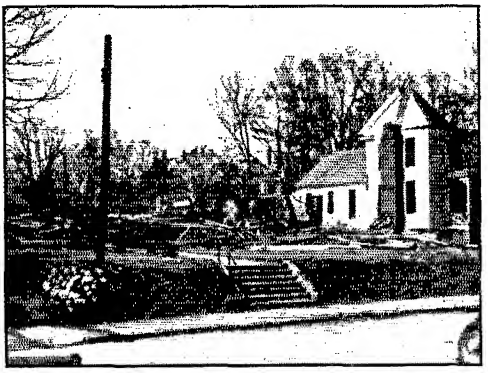
The bulk of that story was told in the May issue of *QST*. Since that issue was "put to bed" in the first week of April, however, other disasters have occurred and additional reports on those then past or in progress have arrived. In consequence, there is a big and impressive sequel to the May story to be told in this issue.

THE MOOSE RIVER MINE

Inverting chronology for the sake of current-events interest, the first piece of work to be recorded is that of the Canadian radio amateurs who, according to CP and the *Ottawa Evening Citizen*, "PLAYED GREAT PART IN GETTING MOOSE RIVER NEWS TO OUTSIDE WORLD." Operating for the Halifax bureau of the Canadian Press, a group of Nova Scotian amateurs went with little sleep and food for four days and nights to transmit news from the Moose River mine concerning the three men entrapped there. Telephone service being unavailable, before daylight Sunday a car manned by Art Crowell, VE1DQ, Bill Horne, VE1GL, and Trevor Burton, VE1CP, left Halifax carrying portable battery-operated equipment. One hour after arrival at Moose River communication was established with Cliff Shortt, VE1AW, who acted as receiving center. QRM was found to be bad, so the coöperation of the Canadian Radio Commission was solicited and an announcement requesting amateurs to refrain from using the low-frequency end of the 3500-kc. band was broadcast. Other amateurs on 3550 kc. and above took up the plea—among them John McGrail, Jr., VE2BP, W. F. Hammond, VE2GH, and J. Miles Whittaker, VE3MB—and soon the lower channels were practically clear of local QRM. The Canadian Press paid extensive credit to the amateur work performed in its behalf.

THE TUPELO TORNADO

From Nova Scotia the scene shifts 'way down to Mississippi. On April 9th the terrible tornado struck Tupelo and ravished the entire city. Coast Guard headquarters in Washington wired A.R.R.L. headquarters in West Hartford stating that an emergency communications truck operating under the call NRSA on 4050 kc. had been dispatched to Tupelo to assist in locating injured and missing persons, and requesting amateur contacts. Within ten minutes after this request was relayed, B. G. L. Smith, W4DEP, was QSO NRSA. Continuous watch was maintained from W4DEP from 4:20 p.m. until midnight; at 8 a.m. Lloyd J. Carlson, W4LN, took over the schedules, relieved later by Ned C. Cantrell, W4AEP. Elmer W. Palmer, W5CRG, of Okolona, where



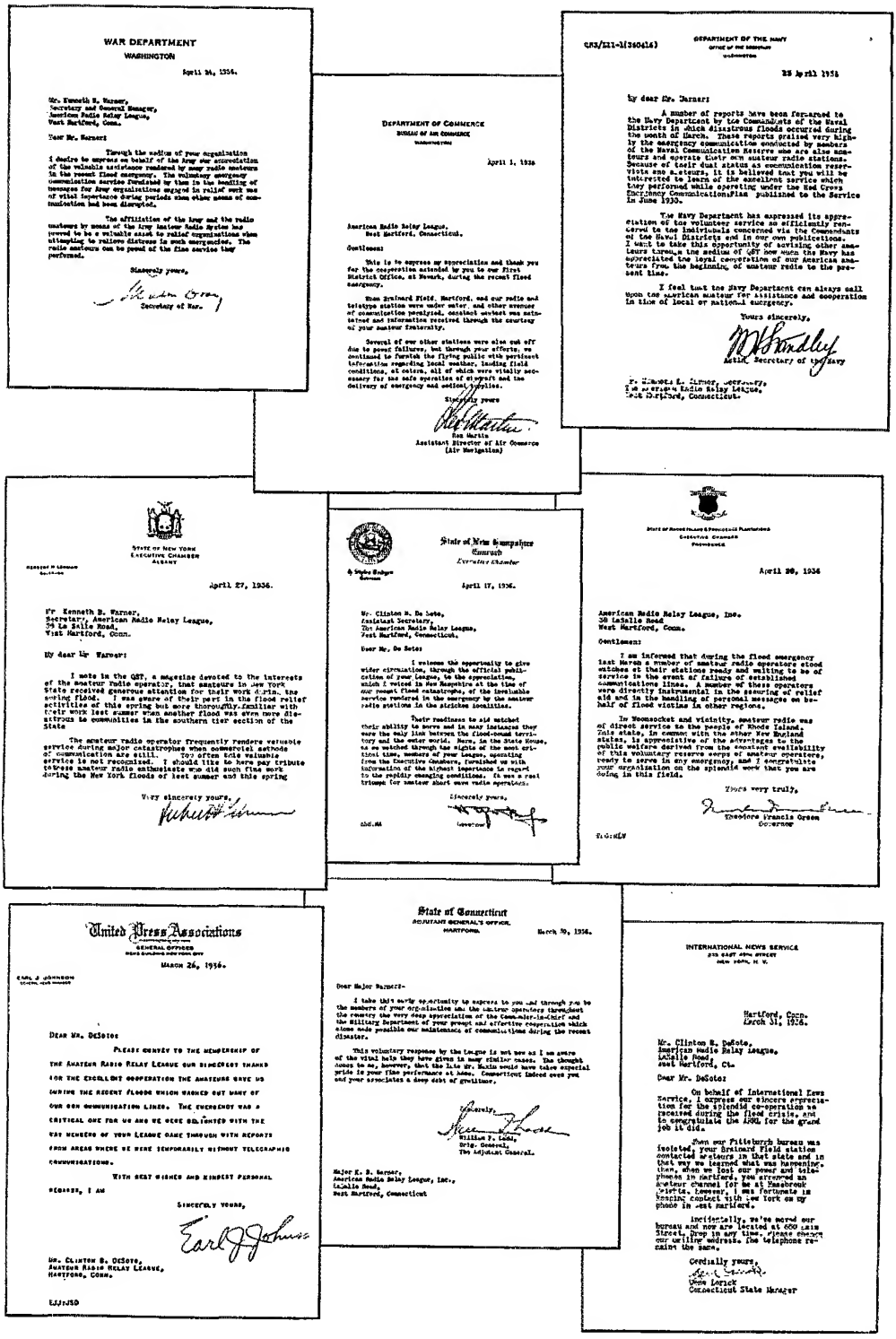
REMAINS OF THE GRACE EPISCOPAL CHURCH AND RECTORY, GAINESVILLE, REV. GEOFFREY C. HINSHELWOOD, W4BBV, PASTOR
The church is the tangled pile of wreckage at left center

Tupelo tornado victims were taken for hospitalization, also maintained schedules with NRSA. A continuous flow of traffic for Red Cross and storm victims was handled during the two days of operation of NRSA.

THE GAINESVILLE TORNADO

Monday morning, April 6th, at 8:34 a.m., the tornado struck Gainesville with a velocity estimated by U. S. meteorological experts as more than five hundred miles per hour. Everything went before it—brick buildings, stone buildings, roofs, garages. Not one of the Gainesville hams was killed or injured. W4ACH was living in the Dixie Hunt Hotel, which was completely wrecked —half of it blowing down (the other half!). W4TL lived just on the outer rim of the storm area; his home escaped serious damage. W4CWE

* Assistant Secretary, A.R.R.L.



WAR DEPARTMENT
WASHINGTON

April 24, 1936.

Mr. Kenneth B. Warner,
Secretary and General Manager,
American Radio Relay League,
West Hartford, Conn.

Dear Mr. Warner:

Through the medium of your organization I desire to express on behalf of the Army our appreciation of the valuable assistance rendered by many radio amateurs in the recent flood emergency. The voluntary emergency communication service furnished by them in the handling of messages for Army organizations engaged in relief work was of vital importance during periods when other means of communication had been disrupted.

The affiliation of the Army and the radio amateurs by means of the Army Amateur Radio System has proved to be a valuable asset to relief organizations when attempting to relieve distress in such emergencies. The radio amateurs can be proud of the fine service they performed.

Sincerely yours,

Secretary of War.

DEPARTMENT OF COMMERCE
BUREAU OF AIR COMMERCE
WASHINGTON

April 1, 1936

American Radio Relay League,
West Hartford, Connecticut.

Gentlemen:

This is to express my appreciation and thank you for the cooperation extended by you to our First District Office, at Newark, during the recent flood emergency.

Mines Brainard Field, Hartford, and our radio and teletype station were under water, and other avenues of communication paralyzed, occasion several weeks was retarded and information received through the courtesy of your amateur fraternity.

Several of our other stations were also cut off due to power failure, but through your efforts we continued to furnish the flying public with pertinent information regarding local weather, landing field conditions, at others, all of which were vitally necessary for the safe operation of aircraft and the delivery of emergency mail and medical supplies.

Sincerely yours

Eugene Vidal
Director of Air Commerce

Ben Martin
Assistant Director of Air Commerce
(Air Navigation)

NAVY DEPARTMENT
OFFICE OF THE SECRETARY
WASHINGTON

NRS/121-1(360416)

28 April 1936

My dear Mr. Warner:

A number of reports have been forwarded to the Navy Department by the Commandants of the Naval Districts in which disastrous floods occurred during the month of March. These reports praised very highly the emergency communication rendered by members of the Naval Communication Reserve who are also amateurs and operate their own amateur radio stations. Because of their dual status as communication reservists and amateurs, it is believed that you will be interested to learn of the excellent service which they performed while operating under the Red Cross Emergency Communications Plan published to the Service in June 1930.

The Navy Department has expressed its appreciation of the voluntary service so efficiently rendered to the individuals concerned via the Commandants of the Naval Districts and in our own publications. I want to take this opportunity of assisting other amateurs through the medium of QST how much the Navy has appreciated the loyal cooperation of our American amateurs from the beginning of amateur radio to the present time.

I feel that the Navy Department can always call upon the American amateur for assistance and cooperation in time of local or national emergency.

Yours sincerely,

Acting Secretary of the Navy

Mr. Kenneth B. Warner, Secretary,
American Radio Relay League,
West Hartford, Connecticut.

STATE OF NEW YORK
EXECUTIVE CHAMBER
ALBANY

April 27, 1936.

Mr. Kenneth B. Warner,
Secretary, American Radio Relay League,
38 La Salle Road,
West Hartford, Conn.

My dear Mr. Warner:

I note in the QST, a magazine devoted to the interests of the amateur radio operator, that amateurs in New York State received generous attention for their work during the spring flood. I am aware of their part in the flood relief activities of this spring but more thoroughly familiar with their work last summer when another flood was even more disastrous to communities in the southern tier section of the State.

The amateur radio operator frequently renders valuable service during major catastrophes when commercial methods of communication are still. Too often this valuable service is not recognized. I should like to here pay tribute to these amateur radio enthusiasts who did such fine work during the New York floods of last summer and this spring.

Very sincerely yours,

State of New Hampshire
Concord
Executive Chamber

April 17, 1936.

Mr. Clinton B. DeSoto,
Assistant Secretary,
The American Radio Relay League,
West Hartford, Connecticut.

Dear Mr. DeSoto:

I welcome the opportunity to give wider circulation, through the official publication of your League, to the appreciation, which I voiced in New Hampshire at the time of our recent flood catastrophe, of the invaluable service rendered in the emergency by the amateur radio stations in the stricken localities.

Their readiness to aid matched their ability to serve and in many instances they were the only link between the flood-bound territory and the outer world. Here, in the State House, as we watched through the night of the most critical time, members of your League, operating from the Executive Chambers, furnished us with information of the highest importance in regard to the rapidly changing conditions. It was a real triumph for amateur short wave radio operators.

Sincerely yours,

Governor

chd.MA

STATE OF RHODE ISLAND & PROVIDENCE PLANTATIONS
EXECUTIVE CHAMBER
PROVIDENCE

April 28, 1936

American Radio Relay League, Inc.
38 LaSalle Road
West Hartford, Conn.

Gentlemen:

I am informed that during the flood emergency last March a number of amateur radio operators stood watches at their stations ready and waiting to be of service in the event of failure of established communications lines. A number of these operators were directly instrumental in the securing of relief aid and in the handling of personal messages on behalf of flood victims in other regions.

In Woonsocket and vicinity, amateur radio was of direct service to the people of Rhode Island. This state, in common with the other New England states, is appreciative of the advantages to the public welfare derived from the constant availability of this voluntary reserve corps of amateur operators, ready to serve in any emergency, and I congratulate your organization on the splendid work that you are doing in this field.

Yours very truly,

Theodore Francis Green
Governor

T.F.G:M.L.W

United Press Associations
GENERAL OFFICES
NEW BUILDING NEW YORK CITY

EARL J. JOHNSON
GENERAL MANAGER

MARCH 26, 1936.

DEAR MR. DESOTO:

PLEASE CONVEY TO THE MEMBERSHIP OF THE AMATEUR RADIO RELAY LEAGUE OUR SINCEREST THANKS FOR THE EXCELLENT COOPERATION THE AMATEURS GAVE US DURING THE RECENT FLOODS WHICH WASHED OUT MANY OF OUR OWN COMMUNICATION LINES. THE EMERGENCY WAS A CRITICAL ONE FOR US AND WE WERE DELIGHTED WITH THE WAY MEMBERS OF YOUR LEAGUE CAME THROUGH WITH REPORTS FROM AREAS WHERE WE WERE TEMPORARILY WITHOUT TELEGRAPHIC COMMUNICATIONS.

WITH BEST WISHES AND KINDEST PERSONAL REGARDS, I AM

SINCERELY YOURS,

Earl J. Johnson

MR. CLINTON B. DESOTO,
AMATEUR RADIO RELAY LEAGUE,
HARTFORD, CONN.

EJJ:JSD

State of Connecticut
ADJUTANT GENERAL'S OFFICE
HARTFORD

March 30, 1936.

Dear Major Warner:-

I take this early opportunity to express to you and through you to the members of your organization and the amateur operators throughout the country the very deep appreciation of the Commander-in-Chief and the Military Department of your prompt and effective cooperation which alone made possible our maintenance of communications during the recent disaster.

This voluntary response by the League is not new as I am aware of the vital help they have given in many similar cases. The thought comes to me, however, that the late Mr. Hoover would have taken especial pride in your fine performance at Ashe. Connecticut indeed owes you and your associates a deep debt of gratitude.

Sincerely,

William P. Libby,
Brig. General,
The Adjutant General.

Major K. B. Warner,
American Radio Relay League, Inc.,
LaSalle Road,
West Hartford, Connecticut

INTERNATIONAL NEWS SERVICE
235 EAST 45TH STREET
NEW YORK, N. Y.

Hartford, Conn.
March 31, 1936.

Mr. Clinton B. DeSoto,
American Radio Relay League,
LaSalle Road,
West Hartford, Ct.

Dear Mr. DeSoto:

On behalf of International News Service, I express our sincere appreciation for the splendid co-operation we received during the flood crisis, and to congratulate the ARRL for the grand job it did.

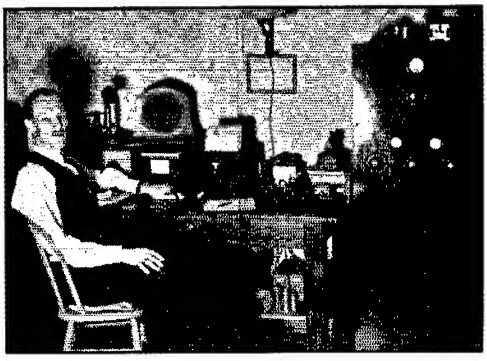
When our Pittsburgh bureau was isolated, your Brainard Field station contacted operators in that state and in that way we learned what was happening. Then, when we lost our power and telephones in Hartford, you arranged an amateur channel for me at Meadbrook Exercise. However, I was fortunate in keeping contact with our bureau on my phone in West Hartford.

Incidentally, we've moved our bureau and now are located at 600 Main Street. Drop in any time, please change our mailing address. The telephone remains the same.

Cordially yours,

Owen Lorick
Connecticut State Manager

was on his way from Cornelia to Gainesville when the storm struck; when he arrived, he found the radio shop at which he worked a wreck. W4BBV ("The Parson") was in the direct path of the frantic monster; seeing one of the twin twisters coming, bringing with it a hen coop or some other large object at least one hundred feet



W4DEP, OPERATED BY B. G. LOWREY SMITH, MEMPHIS, PRINCIPAL CONTACT FOR THE COAST GUARD MOBILE STATION NRSA, WHICH DID RELIEF WORK IN THE TUPELO TORNADO AREA

in the air, he warned the family, held the back door against the wind, saw his church lifted up, carried a few feet, then torn apart—a building 140 feet long by 35 feet wide—and then the roof of the house, swept away into the roar of the monster. . . .

As soon as possible W4BBV (the Rev. Geoffrey C. Hinshelwood, to whom thanks for much of this report), who is the A.A.R.S. Radio Aide for Georgia, commandeered a Bell Telephone Truck and loaded up his gear in the pelting rain to be transported to the sub-station, the only place where there might be power. George B. Stoffregen, Jr., W4CWE, had the same idea. But high-tension QRM was too tough. The town was a shambles and two large business houses were on fire. But by evening the Federal Building had emergency power and W4BBV and W4BBV, Jr., hauled the rig up four flights, commandeered a beautiful oak table and four or five comfortable armchairs from the Federal Judge's chambers, and went to work. Meantime, a group of hams with battery-powered equipment had arrived from Athens, led by Vernon J. Cheek, W4ADN, with a group of N.C.R. members. Setting up in the third floor of the ruins of the Princeton Hotel, they were the first to contact the outside world; Eugene Black, Jr., W2ESO, a student at Carnegie Tech., later took over the operation of this rig. The third station to be set up was portable W4CDH, from Atlanta, manned by the owner, Howard W. Stephens, and Irving S. Miller, manager of the Wholesale Radio store in Atlanta, who provided the equipment which was powered by a converter. W4CDH was set up in the Methodist Church, one of the few downtown buildings still standing, which served as Red Cross headquarters, morgue, hospital, and food relief station. The first contact was made at 2 a.m. on the 7th.

Many distress messages were handled by all three stations, schedules having been previously made by the Athens and Atlanta groups. On Tuesday an Army net was set up by W4IR, clearing from W4BBV, assisted by L. C. Mabb, W4CUX, Olin P. Lawson, W4BTB, and Rudolph Bailes, W4TL, through WLQT in Fort Munroe, Va., and WLM. A large quantity of traffic went out over Trunk Line "D," and many other stations were contacted. W4CDH was in constant communication with W4AEI and W4KU; operating a total of 33 hours, 197 emergency messages were handled. On Wednesday power became available. W4CWE took over from W4CDH, handling another 150 messages. W4BBV, assisted by W4TL, worked continuously from Tuesday morning until Friday evening, when Federal inspectors decided the building must be vacated; approximately 200 or more messages were handled. Each station was given assistance in the way of stenographers and Boy Scout runners. Amateurs coöperated generally in keeping channels clear. Among the other amateurs visiting Gainesville and offering their services as relief operators were W4UC, W4DAF, W4DGG, W4BTI, W4CJF and W4DYX.

THE OHIO RIVER FLOOD

East of Pittsburgh there's the Allegheny and the Monongahela and their many tributaries. West of Pittsburgh there's the Ohio. Into the broad Ohio late last March coursed the turbulent flood waters that had reached record peaks of both height and destruction in western Pennsylvania. All along the Ohio cities were inundated, with resultant property damage and loss of life. Established communications facilities were retained intact to a surprising degree, but there was nevertheless opportunity for excellent amateur emergency work.

First locality along the Ohio west of Pittsburgh from which amateur work was reported is Sewickly, Pa. Although without serious flood damage due to its location on a high bank, the town was without power or communications for several days. K. H. Newbury, W8LOQ, assisted by F. R. Smith, W8CCD, Archie K. McCallister, W8IQS, Roy L. Johnson, W8NEK, and Glenn E. Kautz, W8LFU, installed his station in the local hospital, which had emergency power, and operated there for about 40 hours, handling schedules through W8LSF on Trunk Line "A" and W8YA.

Down the Ohio swept the raging waters to Wheeling, West Virginia, rising to a crest of 55.6 feet, spreading death and desolation through this industrial center. More than a score of persons lost their lives, and one family out of every

three was homeless. Property damage ran into millions. Five thousand telephones were out of order for a period of weeks. During the flood crisis two amateur stations were on continuously—W8HD-WHLF, operated by C. S. Hoffman, Jr., and W8HWT, Louis M. Kline—and N8DOB, A. B. Creighton, was on for two days handling U.S.N.R. traffic between NDE, Norfolk, and Cincinnati. W8HD, of course, worked into the Army net, scheduling W8ZG and W3CXL, as well as W8KWA and state A.A.R.S. stations, half-hourly. The Red Cross dispatched news of the disaster to Washington through this station and requested boats; in response, a fleet of a dozen Coast Guard boats arrived from Chicago. W8HWT was fortunate in having a telephone circuit, useful both in originating and delivering traffic. Through W8GEG he arranged a two-way program between broadcast stations WWVA and WMMM, which stimulated public interest in Red Cross donations so that truck load after truck load of food, medical supplies, milk, etc., poured into Wheeling, all checked and OK'ed back through W8HWT. Both W8HWT and W8HD were on for nearly 50 hours during the flood crisis when no other communications were available, and more than 250 messages were handled.

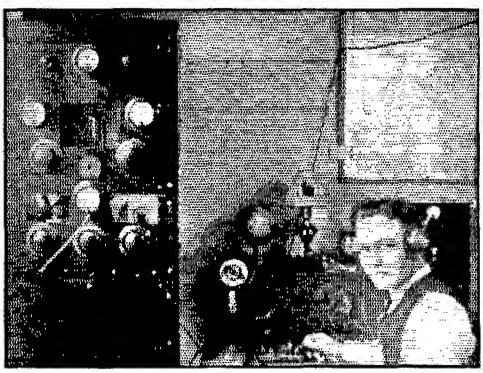
Below Wheeling at Shadyside, Ohio, Fred Baker, W8JDJ, was the key point in a 160-meter 'phone net which included W8OIG, W8FNN, W8JWL, W8OIL and others. As the flood crisis moved down the river this net moved its activities with it. Information concerning conditions was secured for WWVA, and a system of broadcast delivery of messages devised. In the midst of this activity there came a request for an amateur station to be sent to Powhatan, Ohio, a small town then completely isolated. Harold S. Davis, W8EOY, with great difficulty carried his 40-meter rig to the region and tied in with the 160-meter net, handling traffic for the Red Cross, police, etc. Phil L. Reilly, W8JOY, and C. R. Glaser, W8DGO, served as relief operators at W8JDJ. About 125 official messages were logged over a period of 100 hours with many more private messages not recorded.

Down the river the flood waters spread out, and conditions were less severe. The community of Paden City, West Virginia, was isolated for a time, however, and Virgil Henthorn, W8JWL, was the sole means of communication. Down farther still, at Huntington, Edwin L. Murrill, W8OK-WLHF, was active with emergency traffic. All up and down the river, of course, dozens of amateurs coöperated in dispatching the traffic from the more seriously-devastated areas.

RE MARCH FLOOD ACCOUNT

A large quantity of material concerning amateur work during the March flood emergency has come in subsequent to the completion of the account appearing in the May issue of *QST*, some repetitious, some new. The gist of the new reports has been abstracted in the following paragraphs

Pennsylvania: A corrected list of the operators at W8NKI, Pittsburgh, shows Alex Speyer, W8DML; Phil Morrison, W8FIS; Bob Long, W8JFM; Tommy Patterson, W5CEN, and Walt Coss, W8NEJ. Alexander H. Lindsay, W8CAX,



W4LN, ALTERNATE CONTACT STATION FOR NRSA, OPERATED BY LLOYD J. CARLSON, ALSO OF MEMPHIS

L. G. Fabian, W8GJM, both of Pittsburgh, and a mobile station relayed traffic from the East Liberty Armory to Sharpsburg on 56 mc. for the National Guard; W8CAX was also on 3500 kc.

J. H. Ziglinski, W8OLM, Natrona, called QRR on 160-meter 'phone, his house flooded and neighbors endangered; W8IRY answered, sent boats to the rescue. Wm. A. Shafer, W8NRL, West View, 160-meter 'phone, originated some 200 messages with his mother handling the land line.

F. J. O'Brien, W8DIG, Sayre, although himself forced to use portable equipment and three different power sources, handled traffic on conditions in the Susquehanna Valley, press for UP from Williamsport, railroad dispatches where wires were down, and maintained an A.A.R.S. watch on the Williamsport and Wilkes-Barre areas. C. C. Kahn, W8BFF, although in flooded Towanda, had little traffic, so, although keeping constant watch for two days, he stayed off the air to reduce QRM; some other stations should have followed his example.

At Emporium, Pa., R. N. Palmer, W8OYK, kept the city in contact with the outside world for a period of four days. W. P. Mueller, W8OYG, took over a part of the Emporium traffic for two days. A network including W3EPJ, W3EOP, W3CB, W2GTW, W2BLU and W3NF handled ice reports and warnings along the Delaware River between Port Jervis, N. Y., and Easton, Pa.

(Continued on page 74)

What the League Is Doing

League Activities, Washington Notes, Board Actions—For Your Information

Election Notice

To all members of the American Radio Relay League residing in the Atlantic and New England Divisions:

You are hereby notified that, in accordance with the constitution, an election is about to be held in each of the above-mentioned divisions to elect a member of the A.R.R.L. Board of Directors, the recent directors thereof having been elected president and vice-president, respectively, of the League and consequently resigning their offices as division directors, as required by By-Law 22. In the case of the Atlantic Division the election is to choose a director for the remainder of the 1936–1937 term. In the case of the New England Division, the election is to choose a director for the remainder of the 1935–1936 term. Your attention is invited to Sec. 1 of Article IV of the constitution, providing for the government of A.R.R.L. by the Board of Directors; Sec. 2 of Article IV, defining their eligibility; By-Laws 11 to 22, providing for the nomination and election of division directors. Copy of the constitution and by-laws will be mailed any member upon request.

Voting will take place between July 6, 1936, and August 3, 1936, on ballots which will be mailed from the headquarters office in the first week of July.

Nomination is by petition. Nominating petitions are hereby solicited. Ten or more A.R.R.L. members residing in either of the above-named divisions have the right to nominate any member thereof as a candidate for director therefrom. The following form is suggested:

(Place and date)

Executive Committee
The American Radio Relay League, Inc.
West Hartford, Conn.

Gentlemen:

We, the undersigned members of the A.R.R.L. residing in the ..... Division, hereby nominate ....., of ....., as a candidate for director from this division for the unexpired remainder of the current term.

(Signatures and addresses)

The signers must be League members in good standing. The nominee must be a League member in good standing and must be without commercial radio connections: he may not be commercially engaged in the manufacture, selling or renting of radio apparatus or literature. His complete name and address should be given. All such petitions must be filed at the headquarters office of the League in West Hartford, Conn., by noon of the 6th day of July, 1936. There is no limit to the number of petitions that may be filed, but no member may append his signature to more than one such petition. To be valid, each petition must have the signatures of at least ten members in good standing.

These elections provide the constitutional opportunity for members to put the direction of their association in the hands of representatives of their own choosing. Members are urged to take the initiative and file nominating petitions immediately.

For the Board of Directors:

K. B. WARNER,
Secretary.

May 11, 1936.

The Board Meets

Eugene C. Woodruff, Ph.D., W8CMP, senior director of the A.R.R.L., was elected president of the League, and George W. Bailey, W1KH, was elected vice-president, at the annual meeting of the Board of Directors held in Hartford on May 8th and 9th. In an unexpected move the Board voted to request the F.C.C. to increase the 75-meter 'phone assignment to 3850–4000 kc. but declined to recommend any change in 14-mc. 'phone. Cairo plans were studied, arrangements made for the representation of amateur radio at the June hearings of the F.C.C., personnel chosen for the C.C.I.R. meeting. The Investigating Committee's report was examined, ordered printed for members, and the authority of the Executive Committee revised. A committee was appointed to study the desirability of moving headquarters. Funds were authorized for a new headquarters station, as a memorial to Founder Maxim, at a location yet to be selected, and memorials were adopted on the massing of the late Messrs. Maxim and Stewart. The publication of a history of amateur radio was authorized. The F.C.C. was requested to increase the code speed requirement in amateur examinations to 12½ words a minute.

These were the high lights in a 19-hour meeting of the Board at Hartford, at which every division of the League was represented. In the few minutes that we have to write this report, while the presses wait so that it may reach you in June *QST*, there is not time to write an exhaustive account of the meeting. The minutes of the meet-

ing, which are appended, will give the full details. Nor shall we, in this limited time, endeavor to make any fuller presentation this month of our new officers. Indeed, they do not need it, for they are probably the two best-known directors. Dr. Woodruff, for many years the representative of the Atlantic Division, has visited every section of the nation. He is the chairman of the Cairo Committee. Mr. Bailey, for some years the New England Division's Director, was the chairman of the Investigating Committee. That they are admirably fitted to carry on in the Maxim-Stewart tradition there can be no doubt.

Morning, afternoon and night for two days the Board met, recessing only to have its meals in an adjoining room. It seems to us that, while secretaries wore out lead-pencil points at an amazing rate, every problem of the League that any director could think of was taken up and dissected, new orders issued.

The Board assembled without a chairman, both Mr. Maxim and Mr. Stewart having passed on late in the winter. Although the election of new officers did not occur until the end of the meeting, Dr. Woodruff was immediately put in the Chair by unanimous acclamation and presided throughout the meeting. The Board received reports from its officers and committees, examined the work of the Executive Committee and its own informal actions in the past year, then heard detailed reports from every director present, and thus perfected the background against which it made its subsequent examination of a large number of League matters.

OPERATING MATTERS

The old familiar question of 'phone frequencies was again very much in the front rank at this year's meeting. Lengthy consideration was given the question of 14-mc. 'phone and five different motions were before the Board on this subject, four of them having for their purpose a widening of the 'phone allocation. Perhaps largely because no method was visible for securing uniformity in 'phone assignments with Canada, none of these motions passed. However, in a move that to us seemed to be as much a surprise to the victors as to the opponents, the Board voted to request the Commission to give 75-meter 'phone another 50 kc.: 3850–4000.

There was the general feeling that the code speed in examinations is too low; 15 words per minute was discussed but the decision was to ask F.C.C. to raise the ante to 12½. Plans were made to improve still further the communication service rendered by amateurs in emergencies, by making available necessary expense money for S.C.M.'s and by arranging for a special small manual on amateur emergency communication. F.C.C. was implored to do something about the bootlegging of calls and to be more energetic in their monitoring of bad notes and overmodulation. Opposition was expressed to participation by amateurs in contests on the air staged as advertising stunts by commercial companies. The Board did not regard the Griffin Plan as feasible and abandoned it, and did not regard favorably a somewhat similar international plan being discussed in I.A.R.U. circles. They similarly thought it inadvisable to attempt to force North & South American uniformity in 'phone assignments by international treaties. A proposal to request the registering of transmitting apparatus was turned down, as were suggestions to extend the R-S-T System to 'phone and to get up a special code of abbreviations for amateurs beginning with the letter X.

INVESTIGATING COMMITTEE

The report of the Investigating Committee was examined. Pursuant thereto, amendments were made to the constitution regarding the authority of the Executive Committee and the calling of special meetings, and to the by-laws dealing with balloting for director. The report was ordered published and made available to members upon request. The Board rejected a proposal to set up half a dozen permanent committees to have administrative supervision of all the activities of the League. The salaries of the secretary and treasurer were reviewed and reaffirmed.

ADMINISTRATIVE MATTERS

A committee with Professor Caveness as its chairman and Directors Adams and Reid as its other members was appointed to examine the advantages and disadvantages of moving League headquarters to a more nearly central location, to report to the Board in four months. The erection of the new headquarters station awaits that decision. The publication of Clinton B. deSoto's history of amateur radio was authorized, and it will be made available as soon as possible. Funds were appropriated for the administrative expenses of directors within their divisions. By-Law 48, regarding conventions, was amended to accord with an earlier resolution of the Board. Field contact plans were discussed. Mr. Segal was continued as the League's General Counsel. Amongst the proposals examined by the Board but rejected were the contemplated splitting of the Central Division into two divisions, establishment of life membership, issuance of membership cards, reorganization of the League in terms of local chapters, and the pairing of candidates for director and alternate in the fashion of political slates.

INTERNATIONAL MATTERS

Naturally the making of plans for the international representation and protection of the amateur occupied a considerable portion of the Board's time. As factual background for this

study it had a report from its Cairo Committee and heard an informative address by Mr. Gerald C. Gross, chief of the international division of the F.C.C. Certain data and forms were ordered prepared for future use. The League's offer to send its representatives to the meeting of the C.C.I.R. at Bucharest in the name of and on behalf of the I.A.R.U. having been accepted by the latter, on an expense-sharing basis, the Board selected as its representatives John C. Stadler, Jr., VE2AP, and James J. Lamb, the technical editor of *QST*, also appropriating funds for the job. A proposal from the director of the Pacific Division to apply for the right to use commercial frequencies during the hours they are not in commercial use was thought unfeasible.

This journal has already reported that the F.C.C. is to have public hearings in the month of June on frequency allocations. These hearings are regarded as the keystone of the whole amateur case at Cairo. The procedure requires that one have counsel to present witnesses to adduce testimony, introduce exhibits, and so on. It will be a big job, doubtless requiring the services of many members of the headquarters staff, perhaps those of the Cairo Committee, and certainly a thorough study of the data accumulated by the latter. After a considerable discussion of the personnel best qualified for this undertaking, the Board engaged General Counsel Segal to be our counsel for the purpose and put the preparation of our case in his hands and those of Secretary Warner, with the right to call into service anyone else they need. The Board also discussed at very considerable length the choice of representatives to send to the Cairo meeting in 1938 and, although no definite appointments for this purpose were made, it was the general feeling that this difficult task should be entrusted to Secretary Warner, who was so recommended by all the members of the Cairo Committee.

A large number of smaller items were acted upon by the Board and a comparable additional number of subjects discussed even when no actions were taken to report in the minutes. If one can imagine fifteen good amateurs and true, each having prepared himself for this meeting over the past several months and then assembling for several days and nights with his similars, it will be apparent that there was not much in our affairs that didn't have a thorough going over. The Board appropriated $16,700.00 for different purposes and it must be said that much constructive work is under way. With its new president and vice-president, with many knotty problems out of the way and with new instructions issued for the new questions of the day, the members of the Board dispersed to their respective homes and the headquarters staff commences the job of putting into effect the numerous instructions issued.

This account must end right here if it is to get into June *QST*. Details are to be found in the minutes themselves:

Minutes of 1936 Annual Meeting of Board of Directors, American Radio Relay League

May 8 and 9, 1936

IN compliance with the constitution and responsive to due notice, the Board of Directors of the American Radio Relay League, Inc., convened in regular annual meeting at The Hartford Club, Hartford, Conn., on May 8, 1936. The meeting was called to order by Dr. Eugene C. Woodruff, senior director, at 10:07 a.m., d.s.t. The roll was called, showing the following directors present:

Bennett R. Adams, Jr., Southeastern Division
Russell J. Andrews, Rocky Mountain Division
E. Ray Arledge, Delta Division
George W. Bailey, New England Division
H. L. Caveness, Roanoke Division
Ralph J. Gibbons, Northwestern Division
Wayland M. Groves, West Gulf Division
Kenneth T. Hill, Hudson Division
E. L. McCargar, Alternate, Pacific Division
Floyd E. Norwine, Midwest Division
Alex Reid, Canadian General Manager
Edward A. Roberts, Central Division
Eugene C. Woodruff, Atlantic Division

Absent: Charles E. Blalack, Southwestern Division, and Carl L. Jabs, Dakota Division. Mr. Woodruff stated that S. G. Culver, Director, Pacific Division, was unable to attend the meeting and that his alternate, E. L. McCargar, was present in his stead under the authorization provided in the by-laws, with full powers of the director of the Pacific Division. There were also present Secretary K. B. Warner, Treasurer A. A. Hebert, Communications Manager F. E. Handy, Assistant Secretary A. L. Budlong and Technical Editor J. J. Lamb. At the invitation of the Board there were also in attendance, as non-participating observers, Alternate Directors S. J. Bayne, Southeastern Division, and Roy C. Corderman, Atlantic Division.

On motion of Mr. Roberts, by unanimous acclamation Mr. Woodruff was elected Chairman. By unanimous consent the meeting recessed a few minutes to pose for a photograph, during which recess Mr. Blalack joined the meeting, at 10:13 a.m., and Mr. Jabs at 10:15 a.m.

Without dissenting voice the minutes of the previous meeting were approved in the form in which they were issued by the Secretary. Messrs. Norwine and McCargar requested to be recorded as not voting because they had not been present at the previous meeting.

On motion of Mr. Hill, unanimously VOTED that the annual reports of the officers to the Board of Directors are accepted and the same placed on file.

On motion of Mr. Caveness, after discussion, VOTED that the election of president and vice-president is placed as the last item on the agenda for this meeting.

On motion of Mr. Hill, after discussion, VOTED that all acts performed and all things done by the Executive Committee since the last meeting of the Board, and by it reported to the Board, are ratified and confirmed by the Board as the actions of the Board.

On motion of Mr. Gibbons, unanimously VOTED that the Board, having considered its mail vote with reference to offering to send its representatives on behalf of and in the name of the International Amateur Radio Union, to the Fourth Meeting of the C.C.I.R. at Bucharest and underwriting the expense thereof, provided other member-societies of the I.A.R.U. will pay their proportionate share of the expenses, and having examined the same, now ratifies the vote taken and decides to take this action as of June 24, 1935.

On motion of Mr. Andrews, unanimously VOTED that

the Board, having considered its mail vote with reference to calling upon the Chairman of the Investigating Committee to supply each director with a report of that committee's activities and findings not later than thirty days in advance of the next annual session of the Board of Directors, and having examined the same, now ratifies the vote taken and decides to take this action as of December 30, 1935.

On motion of Mr. Groves, unanimously VOTED that the Board, having considered its mail vote with reference to inviting alternate directors to attend the 1936 meeting of the Board of Directors as non-participating observers at their own expense, and having examined the same, now ratifies the vote taken and decides to take this action as of April 27, 1936.

Investigating Committee Report Available

The Board of Directors has decided to make available to the membership the report of its Investigating Committee. Any member wishing a copy of this report may obtain it by writing to the Secretary.

On motion of Mr. Gibbons, unanimously VOTED that the Board, having considered its mail vote with reference to inviting the Chief of the International Division of the Federal Communications Commission to address the Board briefly on international matters at its annual meeting, and having examined the same, now ratifies the vote taken and decides to take this action as of May 6, 1936. It was thereupon ORDERED that the representative of the Federal Communications Commission is to be heard upon the reconvening of the meeting on the morrow, May 9th.

On motion of Mr. Caveness, unanimously VOTED that the reports to the Board of Directors of the Investigating Committee of the A.R.R.L. Board and of the Cairo Committee of the A.R.R.L. Board are accepted and the same placed on file.

Mr. Reid presented his report as Canadian General Manager. In turn, every Division Director rendered a report on conditions in his division, Mr. McCargar presenting the report of Mr. Culver. During the reading of the reports, General Counsel Paul M. Segal entered the meeting, at 11:05 a.m. The Board was in brief recess from 12:30 p.m. to 12:38 p.m.

On motion of Mr. Andrews, unanimously VOTED that the sum of three thousand dollars ($3,000.00) is hereby appropriated from the surplus of the League, as of this date, for the purpose of defraying the expenses of holding this meeting of the Board of Directors, any unexpended remainder of this sum to be restored to surplus.

The Board recessed for luncheon at 1:10 p.m., reconvening at 2:23 p.m. with all directors and other persons hereinbefore mentioned in attendance.

On the question of resolutions or other memorials to the memory of the League's late president and vice-president, the Board, having fittingly expressed its sentiments, VOTED, on motion of Mr. Bailey, that the Chair appoint a committee of three directors to reduce these expressions of sentiment to formal language and present the same to the Board by 10:00 o'clock on the following morning, May 9th. Pursuant thereto, the Chair appointed Directors Bailey, Reid and Caveness as a drafting committee, with Mr. Segal as advisor. After extended discussion of the question of erecting a new headquarters station as a memorial to the late president of the League, on motion of Mr. Blalack and by unanimous vote it was ORDERED that this question, and the possible desirability of purchasing the present headquarters premises, together with the possible desirability of moving the headquarters, are postponed for joint consideration some time on the morrow, May 9th.

Pursuant to the agenda and at the request of the Chair, Mr. Bailey presented the recommendations of the Investigating Committee for certain modifications in the constitution of the League. After discussion, moved, by Mr. Blalack, that Section 10 of Article IV of the constitution be amended to read as follows:

"10. There shall be an Executive Committee consisting of the officers of the League which shall meet from time to time to conduct the affairs of the League within its jurisdiction. The Committee shall keep a record of its meetings and actions, and shall report to the Board of Directors for its approval."

After further discussion, on motion of Mr. Gibbons, unanimously VOTED to amend the motion by substituting the following suggested text:

"10. There shall be an Executive Committee consisting of the officers of the League. This committee shall act in the place and stead of the Board of Directors during the intervals between meetings of the Board. Any action taken under this section shall be promptly reported to the Board and shall be subject to the approval of the Board at its next subsequent meeting."

The question being on the adoption of the amended motion, the yeas and nays were ordered and the said question was decided in the affirmative: Whole number of votes cast, 15. Necessary for adoption, 10. Yeas, 15; Nays, 0. Every director voted in the affirmative. So Sec. 10 of Article IV was amended.

After further examination of the proposals of the committee, moved, by Mr. Arledge, that Section 9 of Article IV of the constitution be amended to read:

"9. Special meetings of the Board of Directors may be called by the President at least every three months, by written notice stating the specific object or objects thereof, mailed to each director at least three weeks prior to the date of said meeting."

On motion of Mr. McCargar it was unanimously VOTED to amend the motion by substituting the following text:

"9. Special meetings of the Board of Directors may be called by the President by written notice stating the specific object or objects thereof, mailed to each director at least three weeks prior to the date of said meeting."

The question being on the adoption of the amended motion, the yeas and nays were ordered and the said question was decided in the affirmative: Whole number of votes cast, 15. Necessary for adoption, 10. Yeas, 15; Nays, 0. Every director voted in the affirmative. So Sec. 9 of Article IV was amended.

On the matter of new business introduced by directors, the Chair ruled that such matters shall come up for consideration after the consideration of the items listed in the previously-distributed agenda of the meeting.

On the question of requests to the Federal Communications Commission to amend the amateur regulations concerning the frequencies in the 14-mc. band to be open to 'phone operation:

Moved, by Mr. Groves, that the Board instruct the Secretary to request the F.C.C. to expand the 14,150–14,250 kc. Class-A 'phone assignment to read 14,100–14,300 kc. Mr. Groves requested a record vote. After discussion, the yeas and nays being ordered, the said question was decided in the negative: Yeas, 5; nays, 9. Those who voted in the affirmative are Messrs. Adams, Gibbons, Groves, Hill and Norwine; those who voted opposed are Messrs. Andrews, Arledge, Bailey, Blalack, Caveness, Jabs, McCargar, Roberts and Woodruff; Mr. Reid did not vote. So the motion was rejected.

Moved, by Mr. Groves, that the Board instruct the Secretary to request the F.C.C. to expand the 14,150–14,250 Class-A 'phone assignment to read 14,150–14,300 kc. The yeas and nays again being ordered at the request of Mr. Groves, the said question was decided in the negative: Yeas, 5; nays, 9. Those who voted in the affirmative are Messrs. Adams, Gibbons, Groves, Hill and Norwine; those who voted opposed are Messrs. Andrews, Arledge, Bailey, Blalack, Caveness, Jabs, McCargar, Roberts and Woodruff; Mr. Reid abstained. So the motion was rejected.

Moved, by Mr. Andrews, that the Board instruct the Secretary to request the F.C.C. to expand the 14,150–14,250

Class-A 'phone assignment to read 14,200–14,400 kc. The yeas and nays again being ordered at the request of Mr. Andrews, the said question was decided in the negative: Yeas, 6; nays, 8. Those who voted in the affirmative are Messrs. Andrews, Gibbons, Groves, Hill, Jabs and Norwine; those who voted opposed are Messrs. Adams, Arledge, Bailey, Blalack, Caveness, McCargar, Roberts and Woodruff; abstentions, Mr. Reid. So the motion was rejected.

Moved, by Mr. Caveness, that the Board instruct the Secretary to request the F.C.C. to expand the 14,150–14,250 kc. Class-A 'phone assignment to read 14.000–14,200 kc., effective January 1, 1937. But the motion was rejected.

Moved, by Mr. Arledge, that the Board instruct the Secretary to request the F.C.C. to relocate the 100-kc. Class-A 'phone assignment in the 14-mc. band at 14,300–14,400 kc. But, after further discussion, the motion was rejected.

Moved, by Mr. Jabs, that the Board instruct the Secretary to request the F.C.C. to expand the 3900–4000 kc. Class-A 'phone assignment to read 3850–4000 kc. The said motion was ruled out of order by the Chair, in view of the previous decision to postpone the consideration of new proposals until after the consideration of the previously-distributed agenda.

After discussion of the question of selecting the personnel to be sent to the Fourth Meeting of the C.C.I.R., on motion of Mr. Bailey, unanimously VOTED that the determination of this personnel goes over until the morrow, May 9th, after hearing the representative of the F.C.C. On the question of providing funds for this representation, on motion of Mr. Roberts, unanimously VOTED that there is hereby appropriated from the surplus of the League, as of this date, the sum of twenty-five hundred dollars ($2,500.00) for the purpose of defraying the expenses of representatives of the League sent on behalf of and in the name of the International Amateur Radio Union to the Fourth Meeting of the C.C.I.R. at Bucharest in 1937 and for the participation costs of that meeting, any unexpended remainder of the same to be returned to surplus; and that the Secretary is hereby directed to endeavor to secure from the other member-societies of the I.A.R.U., after the conclusion of the C.C.I.R. meeting, their proportionate shares of the expenses and participation costs incurred by the League, in accordance with the general arrangement set forth in I.A.R.U. Calendar No. 14.

On the question of a better-planned use of the amateur bands, after discussion, moved, by Mr. Hill, that the Board give further consideration to revising the present Griffin Plan to include in its scope only the 7-megacycle band and permit the publication of this revised plan in *QST* at an early date. But, after further discussion, the said motion was rejected.

The Board recessed for dinner at 6:50 p.m., reconvening at 8:38 p.m. with all directors and other persons hereinbefore mentioned in attendance except Mr. Norwine.

On the examination of the possibilities of "planned use" of the 7-megacycle band proposed in the I.A.R.U. Calendar, after discussion, on motion of Mr. Bailey, unanimously VOTED that the subject is laid on the table. Mr. Norwine entered during the above discussion, at 8:42 p.m.

On the question of certain proposals in the Communications Manager's annual report, moved, by Mr. Groves, that the Secretary be directed to request the Federal Communications Commission to raise the code speed in amateur license examinations from ten words per minute to twelve and one-half words per minute. Moved, by Mr. Jabs, that the figure be amended to fifteen words per minute; but the said amendment was rejected. The question being on the adoption of the original motion, the said question was decided in the affirmative. So the Secretary was instructed to request the F.C.C. to raise the code speed to twelve and one-half words per minute.

On motion of Mr. Blalack, unanimously VOTED that the Federal Communications Commission is requested to use all means possible to eliminate call bootlegging and is also requested to engage in a more effective monitoring of "bad notes" and overmodulation, as treated in F.C.C. Rules 381 and 382.

On the question of the desirability of publishing a proposed history of amateur radio, after discussion, on motion of Mr. Groves, unanimously VOTED that the Secretary is authorized to publish "The Story of Amateur Radio," by Clinton B. deSoto, as outlined in Secretary's Letter No. 297 to Directors.

On the question of the possible desirability of seeking uniformity throughout the Americas in 'phone and c.w. allocations by means of regional treaties, after discussion, on motion of Mr. Norwine, unanimously VOTED that the question is laid on the table.

On the question of making a provision for life membership in the League, after discussion, on motion of Mr. Norwine, unanimously VOTED that this question is laid on the table.

Officers' Reports Available to Members

This year, for the first time, the Board of Directors has decided to make available to the membership of the League the annual reports which the officers make to it each April. Copies are available to interested members postpaid at the estimated cost price of 50 cents per copy. Address the Secretary at West Hartford.

On the Communications Manager's proposals for increasing the effectiveness of amateur participation in communication emergencies: After discussion, on motion of Mr. Roberts, VOTED that the Communications Manager is authorized to permit the incurring of necessary expenses by Section Communications Managers during emergencies, up to a maximum of ten dollars ($10.00) per day each, for the purpose of establishing and organizing emergency communication between amateurs. On motion of Mr. Arledge, unanimously VOTED that the Communications Manager is authorized to publish a small instruction manual on amateur emergency communication, and that there is hereby appropriated from the surplus of the League, as of this date, the sum of two hundred dollars ($200.00) for defraying the expenses thereof, any unexpended remainder of said sum to be restored to surplus.

The Chair stated that there was present in the city a member possessing a petition which he desired to present before the Board in person; the Chair requested the Board's decision in the matter. After discussion, on motion of Mr. Blalack, unanimously VOTED to deny the request, because members of the League should present such matters through their individual directors.

The Board adjourned at 9:55 p.m., under order to reconvene at the same place at 9 a.m. on the morrow. The Board reassembled at the same place on May 9, 1936, and was called to order by Dr. Woodruff at 9:16 a.m. with all directors present except Messrs. Andrews and Gibbons, and with all other persons hereinbefore mentioned present except Messrs. Hebert, Segal and Lamb.

Pursuant to previous order, the meeting was addressed by Mr. Gerald C. Gross, Chief of the International Division of the Federal Communications Commission, who explained the work of international conferences and the part therein played by delegations of the United States and the preparations therefor, and who subsequently answered questions asked by various members of the Board. Mr. Gross was thereupon given a rising vote of thanks, upon the motion of Mr. Roberts, and withdrew. Mr. Hebert entered the meeting during the foregoing, at 9:31 a.m.

On the question of amending By-Law 48 to eliminate an inconsistency with the resolution adopted the previous year, after extended discussion, moved, by Mr. Roberts, that By-Law 48 be amended to read as follows:

"48. Before such a convention is held, the parties desiring to conduct the same shall obtain the approval of the Director of the division in which the convention is to be held, by an application setting forth the place

and date of the proposed convention, the territory to be embraced, the particular purpose to be served thereby, the clubs, associations or groups who propose to sponsor it, and the names and addresses of the officers chosen to conduct it. When the Director is satisfied that the approval of such convention will be in the best interests of the League, he shall submit the application to the Executive Committee for its formal approval. Upon such final approval the headquarters shall notify the chairman or secretary of the convention group. The management, program and financial plans of every such convention shall be subject to the approval of the Director of the division in which the convention is to be held."

Moved, by Mr. Blalack, that the proposed text be amended by adding at the end thereof the words "and, at the conclusion of each such convention, there shall be submitted to the Director a record of the financial experience of the convention." But the said motion was rejected. The question then being on the adoption of the original motion, the yeas and nays were ordered and the said question was decided in the affirmative: Number of whole votes cast, 13. Necessary for adoption, 10. Yeas, 13; nays, 0. Those who voted in the affirmative are Messrs. Adams, Arledge, Bailey, Blalack, Caveness, Groves, Hill, Jabs, McCargar, Norwine, Reid, Roberts and Woodruff. Messrs. Andrews and Gibbons were absent. So By-Law 48 was amended as originally proposed.

On the question of certain requests for instructions from the Communications Manager: On motion of Mr. Jabs, unanimously VOTED that the Communications Manager is given discretionary authority in the matter of revising the A.R.R.L. message form. As to the promulgation of an A.R.R.L. amateur abbreviation code, on motion of Mr. Blalack, unanimously VOTED that the Q code shall be retained at least as the foundation of any abbreviation code used by amateurs. On motion of Mr. Hill, unanimously VOTED that there shall be no attempt made to extend the R-S-T System to 'phone operation.

On motion of Mr. Norwine, the Board, by unanimous vote, extended a cordial expression of its thanks and appreciation to the QSL Managers and to the Standard Frequency Stations for their splendid services to amateur radio.

On the question of the possible desirability of purchasing the present headquarters premises, on motion of Mr. Groves, unanimously VOTED that the question is laid on the table.

At the request of the Board, the Communications Manager outlined possible plans for a new headquarters station to be erected as a memorial to the founder of the League, Hiram Percy Maxim. During this discussion Director Andrews and General Counsel Segal entered the meeting, at 11:15 a.m. After discussion, moved, by Mr. Roberts, that the question be laid on the table; but, the motion being put to vote, it was defeated. After further discussion, on motion of Mr. Norwine, unanimously VOTED that there is hereby appropriated from the surplus of the League, as of this date, the sum of seven thousand dollars ($7,000.00) for the purpose of providing a headquarters station and building at a location subsequently to be authorized, any unexpended remainder of this appropriation to be restored to surplus.

The members of the drafting committee appointed the previous day to prepare resolutions on the loss of the League's recent president and vice-president reported that they had been unable to complete their work, and asked an extension of time. Without objection, it was ORDERED that the committee is given the time that it finds necessary to complete its work.

Moved, by Mr. Roberts, that the meeting proceed now to the election of new president and vice-president. The said motion was ruled out of order by the Chair, because a previous order had been entered to put the elections over as the last act of business.

On the further examination of the report of the Investigating Committee: Upon motion of Mr. Blalack, after discussion, VOTED that the report of the Investigating Committee shall be printed and made available to any member of the League upon request, this publication not to include the so-called minority report. Moved, by Mr. Jabs, that the so-called minority report be published at the same time as and be made available with the report of the Investigating Committee. After discussion, in the course of which Mr. Gibbons entered the meeting at 11:54 a.m., Mr. McCargar requested a record vote and the yeas and nays were ordered, as the result of which the said question was decided in the negative: Yeas, 6; nays, 8. Those who voted in the affirmative are Messrs. Andrews, Arledge, Caveness, Jabs, McCargar and Roberts. Those who voted opposed are Messrs. Adams, Bailey, Blalack, Groves, Hill, Norwine, Reid and Woodruff; Mr. Gibbons abstained. So the motion to include the so-called minority report was rejected. Mr. Lamb here entered the meeting, at 12:00 noon.

On motion of Mr. Blalack, unanimously VOTED to proceed now to a consideration of any items in the so-called minority report that directors desire to bring up.

Moved, by Mr. Roberts, that the following committees be appointed from members of the Board; that every member of the Board be appointed on one or more of these committees according to his ability or experience fitting him for filling such a position; that they shall report their activities to the Board whenever they deem it necessary, but shall make a report at every annual meeting of the Board: (1) League policy committee—to supervise legislation, international matters, Washington contact matters and any other matter affecting A.R.R.L. policy on amateur radio problems; (2) finance and operating committee—supervise financial operations, expenditures, leases, rentals, etc., together with supervision of the accounting department; (3) publication and advertising committee—supervise League publications and League advertising policy; (4) membership committee; (5) technical committee; (6) communications committee—supervise Communications Department and proposed field contact plan. But, after discussion, the motion was unanimously rejected.

Moved, by Mr. Roberts, that the salary of Secretary Warner be reduced. After discussion, moved, by Mr. Reid, to amend the motion by changing the word "reduced" to "increased"; but there was no second, so the proposal for amendment was lost. After further discussion, a record vote being requested, the yeas and nays were ordered, and the said question was decided in the negative: Yeas, 7; nays, 8. Those who voted in the affirmative are Messrs. Adams, Andrews, Arledge, Groves, Jabs, McCargar and Roberts. Those who voted opposed are Messrs. Bailey, Blalack, Caveness, Gibbons, Hill, Norwine, Reid and Woodruff. So the motion was rejected. Mr. Roberts requested, and the Chair granted, permission to bring up other items later in the meeting as new business. Moved, by Mr. Jabs, that the salary of the Secretary be reduced to $10,000 per year. The said motion was ruled out of order by the Chair, because a general motion may not be followed by a specific motion. Moved, by Mr. Jabs, to reconsider the vote taken on reducing the Secretary's salary. The said motion was ruled out of order by the Chair, since Mr. Jabs had not voted on the prevailing side.

At the request of the Chair, the Board proceeded to a consideration of personnel to represent the League at the June hearings of the Federal Communications Commission. There followed an extended discussion, in the course of which the Board recessed for luncheon at 1:01 p.m. Reconvening at 2:31 p.m., all directors and other persons hereinbefore mentioned were present. At the proposal of Mr. Hill, unanimous consent was given for a resumption of the consideration of the report of the Investigating Committee. Moved, by Mr. McCargar, that By-Law 18 be amended by inserting, after the words "twentieth day of December of election year.", the sentence "No outer envelopes marked as containing ballots shall be opened until the meeting of the Committee of Tellers held for the purpose of counting the ballots."; and further inserting, after the words "in the presence of each other" and before the words "shall count the vote," the words "shall open the envelopes containing ballots and." The yeas and nays being ordered, the said question was decided in the affirmative: Whole number of votes cast, 15. Necessary for adoption, 10. Yeas, 15; nays, 0. Every director voted in the affirmative. So By-Law 18 was amended.

Unanimous consent was granted Mr. Adams to have recorded in the minutes the fact that the desirability of ap-

pointing the technical editor of *QST* an officer of the League was examined but that the same was thought inadvisable.

Moved, by Mr. Jabs, that the Board instruct the Secretary to request the F.C.C. to expand the 3900-4000 kc. Class-A 'phone assignment to read 3850-4000 kc. Mr. Jabs requested a record vote. The yeas and nays being ordered, the said question was decided in the affirmative: Yeas, 8; nays, 6. Those who voted in the affirmative are Messrs. Adams, Andrews, Caveness, Gibbons, Groves, Hill, Jabs and Norwine. Those who voted opposed are Messrs. Arledge, Bailey, Blalack, McCargar, Roberts and Woodruff. Mr. Reid did not vote. So the Secretary was instructed.

Moved, by Mr. Gibbons, that the Board reconsider its action of the previous day anent the 14-mc. 'phone assignment. The said motion was ruled out of order by the Chair because the Board at that time was engaged in a consideration of items in the report of the Investigating Committee.

The members of the Investigating Committee concurring, the chairman of that committee then stated that the committee rested in the presentation of its report, considering that the action of the Board in authorizing the distribution of the report to members constituted sufficient acceptance thereof.

On motion of Mr. Roberts, VOTED that salaries of employees shall be reviewed. After discussion, on motion of Mr. Roberts, unanimously VOTED that the compensation of the Treasurer is herewith fixed at $1,000 per year. At the further motion of Mr. Roberts, after further discussion, unanimously VOTED that, the opinion of the Board having been solicited on the question of compensation for A. A. Hebert, the Board now recommends to Mr. Warner that the salary of Mr. Hebert as office manager and credit manager be fixed at $4,000 per year. Moved, by Mr. Adams, that the Board recommend to Secretary Warner that Technical Editor Lamb's salary be fixed at $5,000 per year. Pending which, after discussion, on motion of Mr. Hill, the said motion was laid on the table. After further discussion, on motion of Mr. Blalack, unanimously VOTED that matters of salary and operating costs of the League shall not be brought up for detailed consideration until a decision has been reached on the pending question of moving headquarters. Messrs. Hebert and Lamb were absent from the meeting during the above actions.

On the question of the possible desirability of moving headquarters, moved, by Mr. Blalack, that the A.R.R.L. headquarters be moved to a suitable location in the central part of the United States. After further consideration, with unanimous consent the said motion was withdrawn. After further discussion, on motion of Mr. Blalack, unanimously VOTED that a committee of three members of this Board shall be elected to study the question of removing the headquarters of the League to a point more centrally located geographically within the United States, its feasibility, propriety, a choice of possible locations, etc. This committee shall meet from time to time within a period of four months from the date of its election and shall report its findings and recommendations to the members of the Board within that time. The sum of one thousand dollars ($1,000.00) is hereby appropriated from the surplus of the League, as of this date, for the expenses of this committee, any unexpended portion of this sum to be restored to surplus.

Nominations for the committee being in order, those nominated were Messrs. Caveness, Jabs, Roberts, Hill, Arledge, Reid, Adams and Andrews. Messrs. Roberts and Andrews withdrew their names. Messrs. Segal and Budlong were appointed tellers and, the vote having been taken, the result of the first ballot was announced as follows: For Mr. Caveness, 10 votes; for Mr. Adams, 8; for Mr. Reid, 6; for Mr. Hill, 6; for Mr. Arledge, 6; for Mr. Jabs, 4. Messrs. Caveness and Adams were thus elected but, three candidates being tied for the third position, a second ballot was ordered thereon, the result of which was announced as follows: For Mr. Arledge, 6 votes; for Mr. Reid, 6; for Mr. Hill, 3. No candidate having received a plurality, a third ballot was ordered as between Messrs. Arledge and Reid, the result of which was announced as follows: For Mr. Reid, 8 votes; for Mr. Arledge, 7. So the committee consists of Mr. Caveness as chairman and Messrs. Adams and Reid.

Proceeding to an examination of the recommendations of the Cairo Committee: Upon motion of Mr. Blalack, unanimously VOTED that a collection of emergency data shall be made, and assembled so as to permit of rapid scanning where desired, these data to bring out the part amateur radio has played on such occasions; Mr. Handy being instructed to participate in that work and the Secretary requested to lend the collaboration of Mr. deSoto for that purpose.

On motion of Mr. Jabs, VOTED that a form letter completely outlining the case for the amateur, with special attention to his services in emergencies, shall be drafted in such shape that members may use it for their educational work in correspondence with members of Congress, merely filling in a few blanks, this proposal also embracing the preceding one that a collection of emergency data be made.

On motion of Mr. Jabs, after discussion, unanimously VOTED that the representatives to be sent by the League to the Fourth Meeting of the C.C.I.R. at Bucharest on behalf of and in the name of the International Amateur Radio Union shall be John C. Stadler, jr., of Montreal, and Technical Editor James J. Lamb.

Continuing the discussion of personnel for the various missions of the League, there occurred a lengthy discussion in which it became evident that it was the sentiment of the Board that General Counsel Segal was the best-qualified person to act as counsel for the League at the June hearings and that Secretary Warner should be entrusted with the task of representing the League at the Cairo conference. After lengthy consideration, on motion of Mr. Caveness, it was unanimously VOTED that the matter of the League's representation at the June hearings of the F.C.C. shall be left in the hands of Messrs. Warner and Segal and that they shall be permitted to call in as witnesses any persons they think needed.

Mr. Roberts discussed the desirability of splitting the Central Division. After discussion, moved, by Mr. Roberts, that the division be divided into two divisions to be known as the Central Division and the Great Lakes Division, the Central Division to include the states of Indiana, Kentucky and Ohio, the Great Lakes Division to include the states of Michigan, Illinois and Wisconsin. But, after further discussion, the said motion was rejected.

The Board recessed for dinner at 6:43 p.m., reconvening at 8:13 p.m. with all personnel hereinbefore mentioned in attendance.

On motion of Mr. Bailey, unanimously VOTED that there is hereby allocated to each division director of the League and to the Canadian General Manager the sum of two hundred dollars ($200.00) for legitimate A.R.R.L. expenses in his area; and that there is hereby appropriated from the surplus of the League, as of this date, the sum of three thousand dollars ($3,000.00) for the purpose of defraying this expense, any unexpended remainders of this fund on the date of the next annual Board meeting to be restored to surplus.

Moved, by Mr. Norwine, that the publication of the booklet, "How to Become a Radio Amateur," be discontinued. But, after discussion, with unanimous consent Mr. Norwine withdrew the motion.

Moved, by Mr. Blalack, that the League issue small membership cards as well as membership certificates. But there was no second, so the motion was lost.

Moved, by Mr. McCargar, that the American Radio Relay League adopt as fundamental, that the operation of transmitters by private citizens, under reasonable regulation, is a constitutional right and further that the General Counsel be requested to draw up a resolution embodying this idea for action by this Board, and that copies of the resolution be forwarded to the Federal Communications Commission. But there was no second, so the motion was lost.

Moved, by Mr. McCargar, that membership in the American Radio Relay League be made available to all licensed amateur radio operators, regardless of whether they subscribe to *QST* or not, and that the cost of such membership be set at some figure that will cover the cost of administration. But there was no second, so the motion was lost.

Moved, by Mr. McCargar, that the membership of the League be organized into local chapters and that a commit-

tee be appointed from among the present Board to work out details of such organization. But, after discussion, the said motion was defeated.

Moved, by Mr. McCargar, that the A.R.R.L. go on record as favoring a change in the method of allocating frequencies by international agreement, that existing frequency allotments be made permanent as to nations, and that each nation then have the right to assign frequencies to any type of station, consideration being given only to the matter of interference. But there was no second, so the motion was lost.

Moved, by Mr. McCargar, that the A.R.R.L. petition the Federal Communications Commission to permit use by amateurs of frequencies assigned to commercial interests during the time that such frequencies are not in use by the companies to whom they are assigned. But, after discussion, the said motion was dismissed.

Moved, by Mr. McCargar, that the candidates for director and alternate director be paired, both in nominations and elections. But, after discussion, the said motion was defeated.

On motion of Mr. McCargar, unanimously VOTED that the Secretary is instructed to send to the alternate directors all information that is normally sent to directors. On motion of Mr. Jabs, after discussion, unanimously VOTED that the Secretary is instructed to send copies of Secretary's Letters direct to the assistant directors when so requested by the director, provided that this shall not apply to Secretary's Letters marked as confidential.

Moved, by Mr. McCargar, that the Board of Directors suggest to the Federal Communications Commission that all assembled transmitters sold to the public be registered in the name of the purchaser, this information to be kept on file by the Commission. But, after discussion, the said motion was rejected.

On motion of Mr. Adams, after discussion, VOTED that the field contact work of the headquarters staff shall be divided equally between the communications, technical and secretarial groups. Moved, by Mr. Adams, that field contact schedules be set up so as to insure having a headquarters man in attendance at every divisional convention. But, after discussion, with unanimous consent Mr. Adams withdrew the motion.

Moved, by Mr. Arledge, that the Board take the proper steps necessary to prevent the recurrence of certain commercial radio concerns from using the already overcrowded amateur bands to further their private advertising schemes. But, after discussion, with unanimous consent Mr. Arledge withdrew the motion. On further motion of Mr. Arledge, VOTED that it is the sense of this Board that it opposes amateur participation on the air in contests sponsored by commercial companies.

On the question of retaining the services of Mr. Segal, on motion of Mr. Roberts, after discussion, unanimously VOTED that Paul M. Segal is retained as general counsel of the League at a retainer of $1,000 per year.

Moved, by Mr. Hill, that a copy of the officers' reports be sent to each alternate director free of charge, following each meeting of the Board. But, discussion showing that Mr. McCargar's previous motion had already so provided, with unanimous consent Mr. Hill withdrew the motion.

On motion of Mr. Gibbons, ORDERED that the Board proceed now to the election of president and vice-president. On motion of Mr. Reid, two-thirds concurring, Special Rule A was suspended. By unanimous consent Mr. Groves read a letter from former director Frank M. Corlett volunteering his services to the League as president or vice-president.

Nominations for president being in order, Mr. Hill nominated Mr. Bailey; Mr. Blalack nominated Mr. Woodruff; Mr. Gibbons nominated Dr. Burton T. Simpson of Buffalo; Mr. Norwine nominated Mr. Roberts, filing a petition by which he had been so requested. On motion of Mr. Blalack, the nominations were closed. The Chair appointed Alternate Directors Bayne and Corderman as tellers.

The vote having been taken, the result of the ballot was announced by the tellers as follows:

Whole number of votes cast, 15.
Necessary for election, 8.
For Mr. Woodruff, 8.
For Mr. Bailey, 5.
For Mr. Simpson, 1.
For Frank M. Corlett, 1.

Mr. Woodruff, having received a majority of the votes cast, was therefore declared elected president of the League for a term of two years, which announcement was greeted with applause.

Nominations for vice-president being in order, Mr. Blalack nominated Mr. Bailey; Mr. Groves nominated Mr. Caveness; Mr. Reid nominated Mr. Roberts; Mr. Caveness nominated Mr. Corderman; Mr. Gibbons nominated Mr. Herbert Hoover, jr. Mr. Caveness withdrew his name. On motion of Mr. Jabs, the nominations were closed. Mr. Corderman being a candidate, the Chair relieved him as a teller, appointing Mr. Segal in his stead.

The vote having been taken, the result of the first ballot was announced by the tellers as follows:

Whole number of votes cast, 15.
Necessary for election, 8.
For Mr. Bailey, 7.
For Mr. Corderman, 4.
For Mr. Caveness, 2.
For Mr. Roberts, 1.
For S. G. Culver, 1.

No candidate having received a majority, a second ballot was ordered, the result of which was announced as follows:

Whole number of votes cast, 15.
Necessary for election, 8.
For Mr. Bailey, 10.
For Mr. Corderman, 4.
For Mr. Caveness, 1.

Mr. Bailey, having received a majority of the votes cast, was therefore declared elected vice-president of the League for a term of two years, which announcement was greeted with applause.

On motion of Mr. Caveness, the Board adjourned, sine die, at 10:25 p.m.

(In the course of its deliberations the Board also discussed, without formal action, the question of a permanent Washington representative, the League's relations with official Washington, the amateur position with respect to other services, the status of international treaties, preparation of technical studies for the C.C.I.R., the desirable type of apparatus for W1MK, "Operating News" in *QST*, *QST* advertising policy, Cairo surveys. Total time in session, 18 hours, 48 minutes. Total appropriations, $16,700.)

Secretary

Adding A.V.C. to the Ham Super

Modernizing Procedure for FB7, Comet Pro and Similar Receivers

By George Grammer,* W1DF

THE fact that automatic gain control is now standard on practically all the newer models of amateur-band superhet receivers, probably signifies nothing more or less than that amateurs who buy these receivers want a.v.c. for 'phone reception. If we assume that this is the case, then undoubtedly there are many owners of older non-a.v.c. receivers who would like to have it too. The advantages are obvious enough—the r.f. gain is always high for weak-signal reception, while in tuning across a band the loud fellows are kept from tearing the speaker loose from its moorings. Automatic compensation for fading also is something worth having.

Automatic volume control, as probably everyone knows by this time, is simply a method by which the rectified and filtered carrier voltage is utilized to reduce the gain of r.f. stages preceding the rectifier, usually by application of this d.c. voltage to the control grids of variable-μ tubes. An ideal a.v.c. system would have little or no effect on the amplification of signals below the desired level, but would prevent stronger signals from rising above that level. The relatively simple system described here does not give completely ideal results, but is certainly satisfactory for practical operation. It does a good job in preventing blasting, and will hold a wide range of carrier strengths at a level constant enough so that there is comparatively little observed difference in the strength of practically all except the weaker signals.

Automatic volume control is most easily applied to sets in which the second detector can be replaced by another tube without introducing complications in the operation of the receiver. For example, receivers such as the Comet Pro and FB7A or FBXA are relatively easy to change over, since the second detector tube has only one function to perform. In some sets, a combination tube such as the 2A7, 6A7 or 6F7 is used both as second detector and beat oscillator, in which case the tube cannot readily be replaced without installing a separate beat oscillator tube. The chassis layout may not permit this. The receiver should have a fair amount of r.f. gain—preferably two i.f. stages, for instance—for the control to be effective. If there is a pre-selector as well so much the better, since this tube also may be controlled with a resulting increase in overall effectiveness.

The typical circuit changes necessary are shown in Fig. 1. The existing second detector tube should be replaced by a 2A6 or 75, depending upon whether the receiver uses 2.5- or 6.3-volt tubes. A new socket will be required if the present one is other than six-prong. Control of two i.f. stages is shown in Fig. 1, with control of the pre-selector stage, if the receiver has one, indicated by the dotted connection. In sets using a 2A7 or similar type as the mixer, the control voltage also may be applied to the input grid, although this is not recommended when the tube is used as a combination oscillator-mixer because varying grid bias is likely to cause a corresponding variation in oscillator frequency. In such case the a.v.c. action tends to throw the receiver out of tune with the desired signal.

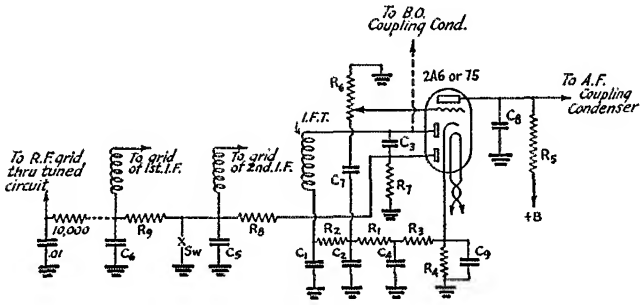


FIG. 1—THE SECOND DETECTOR-A.V.C.-FIRST AUDIO CIRCUIT

R_1—250,000-ohm ½ watt.
R_2, R_3—50,000-ohm ½ watt.
R_4—2000-ohm ½ watt.
R_5—250,000-ohm ½ watt.
R_6—Volume control, 1 to 3 megohms.
R_7—2 to 5 megohms, ½ watt.
R_8—1-megohm ½ watt.
R_9—10,000-ohm ½ watt.
C_1, C_2, C_3—100-$\mu\mu$fd. mica.
C_4, C_5, C_6—0.01-μfd. paper, non-inductive.
C_7—0.1-μfd. paper.
C_8—250-$\mu\mu$fd. mica.
C_9—5-μfd. 25-volt electrolytic.

The first step in installing the system is to disconnect the grid return leads of the i.f. grid coils. These leads are easily identified because they come out of the i.f. transformer cans through the chassis and connect directly to ground. They

*Assistant Technical Editor.

should be by-passed to ground by condensers C_5 and C_6, using connections as short as possible, so that the tuning of the i.f. circuits will not be disturbed. The two transformer returns are connected together through R_9, a decoupling resistor, and to the a.v.c. diode plate (the lower one in Fig. 1) through R_8. R_8, in combination with C_5 and C_6, sets the time constant of the a.v.c. circuit. Larger values of R_8, C_5 and C_6 will increase the time constant so that the a.v.c. does not operate as rapidly. A large time constant is not desirable for high-frequency work because it prevents the a.v.c. from keeping up with rapid fading. A too-small time constant would tend to "wash out" modulation. The values shown have been found to be satisfactory in operation. R_7 is the a.v.c. diode load resistor; its value is not critical so long as it is at least a few megohms. The a.v.c. diode plate gets its carrier voltage from the audio diode plate through the coupling condenser C_3, which is connected between the appropriate tube-socket prongs.

In the second-detector circuit, the i.f. transformer secondary return also should be opened. The audio diode load consists of R_2 and R_1 in series. The load condenser is split into two sections, C_1 and C_2, to aid in filtering r.f. from the lead which goes through the audio coupling condenser, C_7, to R_6, the audio volume control, thence to the grid of the triode section of the tube. C_4 and R_3 comprise a decoupling circuit for keeping r.f. out of the cathode resistor, R_4. C_9 is the usual high-capacity by-pass across the cathode resistor. The grid end of the i.f. transformer winding should be connected to the audio diode plate. Incidentally, it does not matter which of the two diode plates is selected for audio and which for a.v.c. The reason for separating the two is to permit the audio diode return to be made directly to the cathode and the a.v.c. diode return to ground. This method of connection places negative bias on the a.v.c. diode equal to the d.c. drop through the cathode resistor (a matter of a volt or two) and thus delays the application of a.v.c. voltage to the amplifier grids, since no rectification takes place in the a.v.c. diode circuit until the carrier amplitude is large enough to overcome the bias. Without this delay, the a.v.c. would start working even with a very small signal, which is undesirable because the full amplification of the receiver then cannot be realized on weak signals. In the audio diode circuit this fixed bias must be avoided, hence the return is made directly to the cathode.

The method of coupling the beat oscillator will depend upon the particular receiver used. In the FB7A and FBXA the b.o. is coupled to the grid of the 56 detector; when the 2A6 is installed the coupling lead should simply be shifted to the audio diode socket prong, as indicated by the dotted lines in the diagram. In the Hammarlund Pro, the b.o. is coupled to the plate of the second i.f. tube and hence need not be touched.

The triode section of the 2A6 or 75 is used as an audio amplifier, resistance coupling being used on both input and output circuits. R_6 is the audio volume control, R_5 the plate load resistor. C_8 is a mica by-pass which short-circuits any r.f. which may have slipped by the filter in the diode circuit.

A few words about the changes necessary in individual receivers. In the FB7A and XA sets it is necessary, of course, to replace the existing 5-prong socket by a 6-prong. The r.f. filter in the 56 plate circuit (on top of the chassis behind the second detector socket) should be removed; the grid lead for the 2A6 can then be fed through one of the chassis holes thus made available. This lead should be shielded. The audio volume control, R_6, can be mounted on the side of the cabinet below the chassis and alongside the 2A6 socket. The control then comes out the left side at the lower rear corner when the receiver is operating. If this is considered inconvenient, R_6 can be put on the front alongside the "B" switch, in which case shielded leads should be used for connections. The headphone jack arrangement need not be changed except to remake the connection broken with the removal of the plate r.f. filter and to substitute R_5 for the existing plate resistor. The various components can be put in wherever convenient, remembering that short leads are desirable in those parts of the circuit carrying r.f. In the FBXA it is necessary to open the grid-circuit ground return, which in the crystal-filter unit is a resistor connected between grid and ground inside the aluminum box. There are two ways to do this. One is to take out the filter unit (it is generally necessary to loosen the back and right side of the receiver cabinet to do this), unsolder the ground connection and connect a wire to the resistor, feeding this ground wire through with the plus B and plate wires. The second, which does not involve removal of the filter unit, is to put a condenser of about 0.001-μfd. capacity in the external grid lead to the tube and connect a new resistor (a megohm or so) from grid to the junction of C_6 and R_9 (Fig. 1). The a.v.c. on-off switch can be put on the front of the cabinet in any desired position; this circuit carries d.c. only and hence the lead lengths are of no consequence.

In the Comet Pro the detector socket need not be changed, although some of the connections must be rearranged. The plate connections may be left alone except to substitute R_5, the 250,000-ohm plate resistor, for the existing 100,000-ohm unit. Even this need not be replaced, although the higher value will give a bit more audio gain. The other connections should be made as shown in Fig. 1. Since the grid lead from the i.f. transformer comes out the top of the can, it will be necessary to run this lead through the chassis to reach the audio diode prong on the tube socket. The simplest way to do this is to unsolder the grid

cap, take out the screws at the top of the i.f. transformer can, remove the can, and solder on a new grid lead which can be run through the chassis with the other leads. The volume control, R_6, can be mounted on the panel at the right in a position balancing the 'phone jack. The leads to the volume control should be shielded. It will be necessary to drill a hole in the chassis so the grid lead to the 2A6 can go through. The a.v.c. on-off switch may be mounted on the volume control if desired, or can be placed elsewhere on the panel. If on the volume control, the switch should be arranged to close at the full-volume position, thereby cutting out the a.v.c. when the audio gain is at maximum.

Once the connections are completed, the receiver may be lined up and put in operation. If the i.f. already is well aligned, all that it is necessary to do is to touch up the i.f. circuit feeding the diode rectifier; the other circuits will not be affected by the change. For 'phone reception, with the a.v.c. "on," the most satisfactory way of working the system is to set the manual r.f. gain control at or near the full-on position, regulating the signal level by means of the audio gain control, R_6. In tuning across a 'phone band nearly all signals should be at about the same audio level. Very strong or weak signals may rise above or drop below the level to some extent. The chief difference between signals of different strengths, however, will be found to be in the variation of noise background—the stronger the signal the lower the noise. The a.v.c. should be found to be quite effective except when two signals are on approximately the same frequency, in which case the stronger of the two may block the other out completely. When this happens it is often possible to do a little better on the weaker signal by cutting out the a.v.c. and using the r.f. gain control to regulate volume.

For c.w. reception best results are generally secured by cutting out the a.v.c. and using all the audio gain available. The r.f. gain control should be used to control volume. The reason for this is that the beat oscillator signal is relatively weak compared to strong signals at full r.f. gain, with the result that with the r.f. gain full-on, the keyed carrier gives a strong "thump" without much beat signal. Working with full audio and relatively low r.f. gain gives a much louder beat note and greater effective selectivity, since there is less tendency for a strong signal to overload the r.f. circuits and spread out. This method causes no loss of sensitivity to weak signals.

The system as described was tried out on an FBXA receiver, and besides doing a quite satisfactory job of a.v.c. was found to increase the overall gain of the receiver to a considerable extent. The additional gain is in the audio circuit, of course. The difference between the 2A6 and 56 apparently is an R point or two on the r.f. gain control setting.

High-Frequency Radio Fadeouts Continue*

By J. H. Dellinger **

Since Dr. Dellinger initiated correlated study of the periodic short-time daylight fadeouts of radio signals, which phenomenon has been referred to as the "Dellinger Effect" in previous QST *reports, scientific agencies observing solar and terrestrial effects have contributed valuable information extending the correlation of this peculiarity in radio-wave propogation with solar eruptions and terrestrial electrical variations. This correlation was particularly complete in the latest observed instance of the Dellinger Effect on April 8th, as described in this article.*—EDITOR

THE last December issue of *QST*[1] reported the occurrence on a number of occasions of a sudden and complete fadeout of high-frequency radio signals, simultaneously over the illuminated half of the globe. The evidence indicated that these widespread general fadeouts occurred at intervals of approximately 54 days. In January *QST*[2] it was reported further that there was a visible eruption on the sun at the time of each of these fadeouts (insofar as solar observations had been made).

These occurrences have continued, and there is now considerably more knowledge regarding them. A number of persons and organizations have been recording the phenomena and reporting the results to me. The radio amateurs have been particularly helpful.

Sifting the data accumulated, a number of conclusions are indicated. In the first place, it now appears pretty certain that a general fadeout is caused by an eruption on the sun, which sends out radiation (probably ultraviolet) with the velocity of light, producing an immediate intense absorption of radio waves in the earth's iono-

* Publication Approved by the Director of the National Bureau of Standards of the U. S. Department of Commerce.

** National Bureau of Standards, Washington, D. C.

[1] "A New Radio Transmission Phenomenon," *QST*, Dec., 1935.

[2] J. H. Dellinger, "New Cosmic Phenomenon," *QST*, Jan., 1936.

sphere. This occurs throughout the entire half of the earth which is illuminated by the sun. We are thus not concerned in this investigation with fadeouts which occur at night.

In the second place, minor or local fadeouts occasionally happen, which the individual observer cannot distinguish from a widespread general fadeout. This emphasizes the importance of coöperation among observers, as it is only by the comparison of results from a considerable number of places that it can be determined whether a fadeout was a local or a general one.

Confining attention to the general fadeouts, the ones that occur simultaneously over the sun-illuminated hemisphere, these have continued to show the approximate 54-day period, but with some peculiarities. Previous reports in *QST* dealt with the occurrences of March 20, May 12, July 6, August 30 and October 24, 1935. At the end of the usual period in December, not one but two fadeouts occurred, 6 days apart; and similarly in February there were three of the fadeouts within eight days. The December fadeouts occurred December 17th, at 1615 GT, and December 23rd, at 1740 GT. Visible eruptions occurred on the sun at each of these times.

In February, general fadeouts occurred February 6th at 1520 GT, February 8th at 0130 GT, February 14th at 1515 GT. There was a large amount of visible eruptive activity on the sun during this period, but it is not known whether euptions occurred at the particular times of the radio fadeouts.

The fadeout of February 14th was an extraordinary occurrence. Many communication companies, amateurs, the Army, Navy, and others in North and South America and Europe, reported that all communication on high frequencies was wiped out instantaneously and completely at about 1515 GT. Reports from Japan and the Dutch East Indies showed definitely that the effect did not occur in the dark hemisphere. So thorough was the cancellation of all radio transmission in the sunlighted hemisphere that not even "static" could be heard. It was an amazing experience to many operators to have signals not merely go to a very low value but go utterly "dead." At the end of about 15 minutes, frequencies greater than about 10,000 kc. began to come in again, the lower frequencies coming in somewhat later, and completely normal intensities returning on the higher frequencies at about 1600 GT and on the lower frequencies at about 2000 GT. Broadcast frequencies were not known to be affected.

A general fadeout occurred April 8th that was very much like the one of February 14th in all respects. It began at 1656 GT. The higher frequencies began to return at 1645, and the lower frequencies at 1730. There was indication of a slight effect on broadcast frequencies. Besides the great suddenness of this fadeout, and its widespread occurrence, it was noteworthy because of the simultaneous occurrence of an exceptionally brilliant eruption on the sun. Mr. R. S. Richardson of Mt. Wilson Observatory wrote me that a hydrogen spectroheliogram which he took at 1647 GT revealed that a very bright eruption had just started.

The February 14th and April 8th fadeouts were of further interest in that sharp changes in terrestrial magnetism occurred at the precise times of the fadeouts. On February 14th there was a sharp dip in the horizontal and vertical magnetic intensities at 1515 GT, lasting about 15 minutes. On April 8th there was a sharp dip in the horizontal magnetic intensity at 1645 GT lasting about 20 minutes, and at the same time in the vertical magnetic intensity lasting about 40 minutes.

Still further interest attached to the April 8th phenomenon by a report from RCA that their earth current recorder showed an abrupt change at about 1645 GT.

In conclusion, it has been demonstrated that the general fadeouts which occur simultaneously throughout the sun-illuminated hemisphere are at least in some cases simultaneous with an eruption on the sun, and it seems likely that they are in all cases caused by absorption in the ionosphere caused in turn by electromagnetic waves (probably ultra-optical) from a solar eruption. They are sometimes also accompanied by sharp changes in terrestrial magnetism and in earth currents. There is great need of careful observation of all these effects in connection with future fadeouts, in order to establish the causes more definitely and to determine the relations between terrestrial magnetism and the solar and radio phenomena.

Local fadeouts occur which the individual observer cannot distinguish from the general type. They are probably associated with local magnetic disturbances, depending on the more or less turbulent processes of redistribution of the electric charges in the ionosphere. When these local fadeouts occur in the daytime they may easily be mistaken for the general type, and their nature can be determined only by comparison of data from a considerable number of places. It is therefore worth while to continue the reporting of sudden fadeouts occurring in the daytime. Amateurs who are interested in the subject are requested to send in their reports to the American Radio Relay League.[3]

[3] Reports should be addressed to the American Radio Relay League, 38 LaSalle Road, West Hartford, Conn.—Editor.

Strays

W5CVO nominates W9BTB as the U.S. ham having the longest surname—Carl Ahrenhoersterbaemer. Just call him Carl!

HINTS and KINKS for the Experimenter

Tuning the Receiving Antenna

MOST of the modern receivers have so much sensitivity that we don't worry about an antenna, but just hang any old wire on the antenna post and forget it. Some of us, of course, use a doublet with a low-impedance line for receiving, and, finding that it also works well on bands other than that for which it was cut, forget about the probable poor transfer efficiency.

Many of the latest type superheterodyne receivers are equipped for low-impedance input, and are working quite efficiently when a doublet is used on its fundamental frequency. A worthwhile improvement can result, however, by matching things up a little better on the harmonics. Then, too, there is the case of the fellow who wants to use his transmitting Zepp or single-wire-fed Hertz for receiving also. He runs a wire over to the receiver and opens it with a switch when the transmitter is running. But he probably does not get maximum signal transfer, merely an improvement because the transmitting antenna was given first choice of location.

A suggestion that works is shown in the sketch, Fig. 1. It merely consists of a tuning system, readily adaptable to the type antenna being used, coupled to the receiver through a low-impedance line. Provision is made so that by plugging in the proper coil either series or parallel tuning may be used. In the case of a single-wire-fed Hertz, no provision for series tuning is necessary.

To prevent the tubes in the receiver from burning up when the transmitter is running (high grid currents can be drawn even though the plate voltage is off) provision can be made for shorting the input of the receiver. The transmitting antenna, if used for receiving, should be switched from the coupler to the transmitter. The switching can of course be done by relays, greatly simplifying changeover.

—Byron Goodman, W1JPE

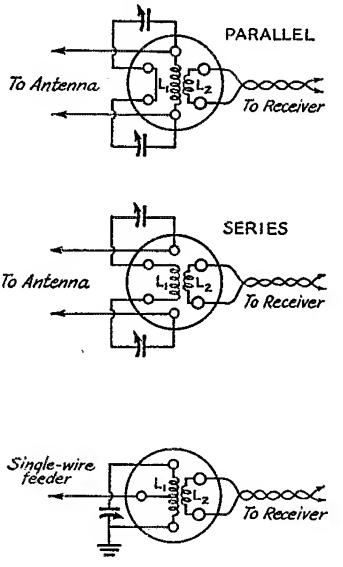


FIG. 1—TUNED COUPLING CIRCUITS FOR THE RECEIVER

Connects to standard 5- and 6-prong coil forms are indicated. In general, inductances must be adjusted by experiment for optimum results. In the parallel-tuned circuits, L_1 should be of sufficient inductance to resonate on the desired band in conjunction with C_1 (100 μμfd.). With series tuning, the number of turns required on L_1 probably will be small. L_2, the link coupling coil, should have from two to five turns, depending upon the band and the input circuit of the particular receiver used.

Antenna-Rotating Device

THE essentials of an electrical method for rotating a beam antenna used by F. G. Southworth, W5EOW, are shown in Fig. 2. Rotation is in sixteen steps, which is more than sufficiently fine in graduation to utilize fully the directional properties of a simple beam antenna. W5EOW writes:

"The antenna is copied after Mims' at Texarkana *à la* December 1935 *QST*. However, it was impossible for me to rotate the antenna from the operating table by mechanical means, therefore the birth of the attached brainstorm.

"Briefly, the antenna is turned by an electric fan motor in one direction only through a 250 to 1 pinion and gear combination. Mounted on the antenna drive shaft is a rotary switch with 16 contacts. One of these contacts points directly north. The selector bar strikes one contact at a time.

"Now on the operating table there is also a 16-contact switch, each contact being labeled a direction; i.e., *N*, *NNE*, *NE*, *ENE*, *E*, etc. On this switch there are 15 selector bars, closing all but one contact at each setting. Mounted alongside this switch is a red pilot light. The hookup is simple; the contact on the switch at the antenna end which points directly north is connected to the contact on the operating table switch tap marked *N* and so on through all sixteen contacts. One side of the motor is wired to 110 volts and the other side to the center contact on the antenna switch. The other side of the 110-volt line goes to the selector

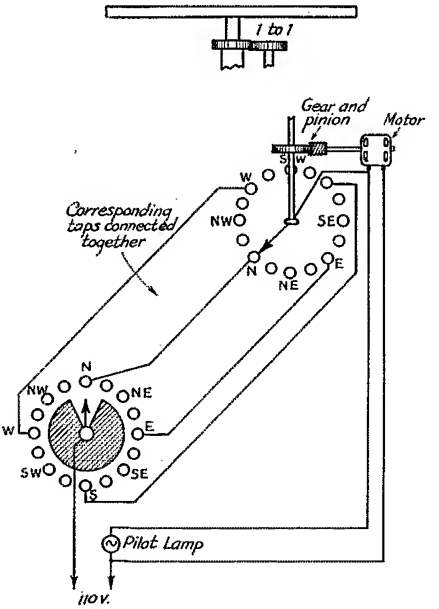


FIG. 2—AN ELECTRICAL METHOD FOR ROTATING A BEAM ANTENNA

It utilizes a small motor with a pair of sixteen-contact switches, the antenna automatically moving to the direction at which the operating-table switch is set.

on the operating table switch. The pilot light is wired in parallel with the motor.

"The operation is simple. Set the operating table switch for any desired direction, which is the direction of the open contact. The pilot light immediately goes on and the motor slowly turns the antenna and the selector switch. When the selector bar reaches the tap corresponding in direction to the open tap on the operating switch, the power is broken and due to the pinion drive the antenna immediately ceases turning. The pilot light also is doused, informing the operator that the antenna is correctly pointed."

Parasitics and Interference

HERE'S a new angle on the ever-present key-click problem: the relation between key clicks (and 'phone interference as well) and parasitic oscillations. The following letter from B. P. Hansen, W9KNZ, tells the story:

"The new transmitter here has a pair of W.E. 242-A's in push-pull in the final, running up around 750 watts on c.w. and about 400 input on 'phone. Keying is accomplished by a d.p.s.t. Dunco a.c. relay. One pair of contacts closes the oscillator center tap. A split second later, the other one closes all high-voltage primaries. Thus the make click is taken care of by straight primary keying, since the primaries are closed with full load. On the break, the primary contacts break first, making elimination of this click easy also. Straight primary keying would give tails, but this is licked by the oscillator center-tap contacts opening a fraction of a second after the primary contacts have opened, thus cutting off the tails before they get a start.

"Now then, I've used this same relay, along with the same customary click filters, for a couple of years on a half-dozen rigs, including the bread-board version of the present one, and never had a squawk on clicks unless the margining of the relay got out of whack due to contact wear. This could always be corrected by re-margining the relay. But when I put this new rig into its steel cabinet and built the parts up on metal chasses, there were the clicks. There was also a nice batch of 'phone QRM to the BCL sets around the neighborhood. Bias to the final is obtained through a 10,000-ohm grid leak only—no fixed bias. One day, was re-neutralizing the thing after having made some changes and happened to put the plate voltage on the final with no excitation on it. The darn thing went right to town, oscillating merrily although the neutralization was perfect. Parasitics, of course. Slapped on a little fixed bias just to see, and sure enough, it took just a little fixed bias to make the final as stable as a rock. Well, a choke made of four turns of hookup wire, wound around a pencil and stuck in the socket grid lead, ahead of neutralizing condensers and everything else, cured that trouble completely. But, to my great surprise, it also cured the key-click trouble, every trace of it. And a hurried test on 'phone showed a remarkable improvement there. Many of the neighborhood cases simply cleared themselves, although of course there are still a few antiques that have some QRM. But, whereas wave traps had no effect before, they now effectively cleaned up the last trace of trouble.

"As it looks to me, it took a split second for the oscillator to start when the key closed. During the interval, there was no bias on the final because there was no excitation and the parasitic had a good chance to get going and put in a few dirty licks. Then, the oscillator got under way, excitation came through, bias resulted, and the thing may or may not have stopped. Probably didn't, because there was always trouble when I modulated. That parasitic may have had a half dozen or more different frequency components—it certainly had a honey in the five-meter band. This could give the effect of a transient resulting from the more common causes of clicks. I'm satisfied that it did.

"Then the hash from the 866's. After I got the clicks cleaned up I called W9KI who lives exactly across the alley from me. He gave me a clean slate on the clicks and the 'phone QRM but said there was some hash at several spots where he picked up my sigs. I closed the steel door of the

(Continued on page 66)

• I. A. R. U. NEWS •

Devoted to the interests and activities of the

INTERNATIONAL AMATEUR RADIO UNION

Headquarters Society: THE AMERICAN RADIO RELAY LEAGUE, West Hartford, Conn.

Conducted by Clinton B. DeSoto

TBTOC:

Novelty is a virtue. However, the time always comes when novelty merges into the commonplace.

That time, it seems, has come to the TBTOC classification. When the requirements for *QST* mention of multi-band DX performance—QSO's between two stations, separated by an ocean, on three bands—were set up, the 28-mc. band was used almost not at all for international communication. To work TBTOC then meant use of 20, 40 and 80—a recognizably difficult accomplishment. Now, using 10, 20 and 40, it is something that a great many amateurs can do with relative ease.

There's no point in having just another commonplace classification in amateur radio. There are enough of them now. TBTOC was originally meant to indicate outstanding DX performance on the principal useful bands. It no longer does that. Consequently, the only logical thing to do—according to a number of DX operators with whom we have talked—is to extend the requirements to include the factor which was not originally contemplated and which has knocked the exclusiveness of the award into the garbage can—the 28-mc. band.

Henceforth, then—and due notice is hereby served on all to whom it may mean anything—*QST* mention will be made only of those who have *four*-band QSO's with another station across one of the seven seas—FBTOC—Four-Band Trans-Oceanic Contact. And here's a mark to shoot at, right at the start:

D4BIU and W1TS accomplished a transatlantic FBTOC in the elapsed time of 11 hours on April 12th last, going from 28 mc. to 3.5 mc. with stops at the intermediate bands between 12:30 p.m. and 11:30 p.m., E.S.T. Signal strengths were good, and one call sufficed to locate each station on schedule on each band. Who's going to be the first to do it in five hours, now?

What is believed to be the first W9 FBTOC has been grabbed off by W9MIN, working with D4ARR. VE2EE believes he has the first for Canada, chalking up both EA4AO and K4KD on four bands. VE1EA was not much later. W1AF adds D4AAR and FA8BG to the FB list. W1WV and W1KH have both turned the trick. OK2AK and W2DC made the grade.

Final TBTOC'ers to be recorded are W1DGG with EA4AO, W8ZKO with G5LA, and—here's a good one—W8BYM with ZS2A.

The mutually-financed TBTOC (now FBTOC) certificate idea has been reluctantly discarded. Only a handful seem to want it—not enough to make the idea feasible. Seems that the average

ANNUAL MEETING OF THE I.A.R.A.C., SHANGHAI

Left to right: R. P. Roberts, XU8RR; G. Oglodkoff, XU8OG; C. J. da Silva, XU8SL; K. W. Johnstone, XU8KW; A. Guillabert, XU8AG; E. W. Brambleby, XU8CB; W. H. Wood, XU8HW; J. Tachikawa, XU8JR; and L. Syberg, XU8LS. This was a sukiyaki dinner; the ashtrays merely denote that it was over when the picture was made!

DX man is not much of a certificate hound—which is probably just as well!

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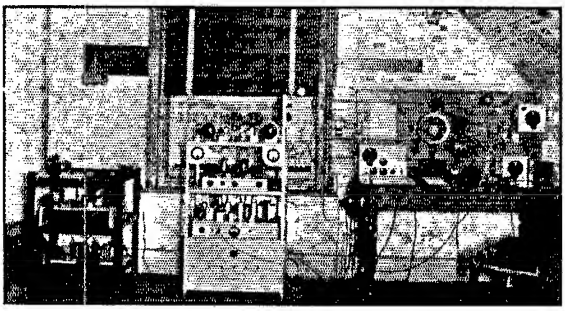
QSL:

The following modifications should be made to the QSL Bureau list published last month:

Cuba: Owing to pressure of other activities, Dr. Pedro Madiedo, CM2WD, who has done such good work in the past, has been forced to relinquish QSL activities to Adolfo Dominguez, Jr., CM2AD, who should be addressed at Milagros 37, Vibora, Habana.



G. ANTHONY CHAPMAN, FOLKESTONE, G2IC, IS WAC, WBE, WAS and claims the first international over-water 5-meter QSO, working F8NW in Boulogne last March 29th

Rumania: Dr. Alex Savopol advises that the correct QSL address for YR cards is in care of Victor Cantuniari, YR5VC, Str. Matei Rasarab, 3 bis, Bucaresti IV.

Newfoundland: Cards for VO stations should be sent to the Newfoundland Amateur Radio Association, P. O. Box 650, St. John's.

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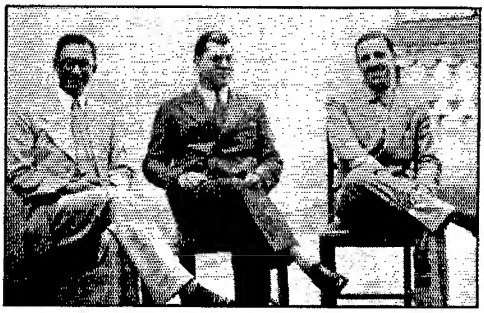
DJDC:

In commemoration of the Tenth Anniversary of the foundation of the D.A.S.D., as well as in recognition of the XII Olympiad being held in Germany this year, the D.A.S.D. is announcing a great German D.A.S.D. Jubilee DX-Contest for 1936, to be held on the five weekends in August. The basic idea of the contest will be to work as many stations in Europe as possible, with a particular emphasis on German working. Full details of the contest rules will be published in the Communications Department of the July issue of *QST*. Folders comprising a statement of the rules and a log sheet are available on request from the D.A.S.D. or through A.R.R.L. Hq. This is the first attempt by the D.A.S.D. to sponsor a world-wide contest, and they solicit the active support of all DX-interested amateurs. Writes W. Slawyk, D4BUF, contest manager: "The sportsmen of the whole world are going to meet in Germany this year for the Olympic Games. May we meet in the ether!"

General:

The ban on amateur transmission has been lifted in Brazil, and PY stations are again active, reports PY1AW .. .. .. It looks like Greece will soon become one of the countries regularly on the air .. .. .. C. Tavaniotis, SV1KE, is quite active—QSL via SX3A or to 17-a Bucharest St., Athens—and a radio club is now in process of organization in Athens .. .. .. W9GDH sends along a new W9 WAC record, having worked CP1AC, VQ8AB, U9ML, K7UA and VK4LW between 7:30 p.m. and 11:00 p.m. C.S.T.—3½ hours .. .. .. The QRA of U9MF is as follows: Box 48, Sverdlovsk, U.S.S.R. .. .. .. SU1RO wants a WAC7 award including Central America, having finally after two years worked due west to K5AC and FM8A—says "it would be nice for USA and me!" .. .. .. First WAC in Mauritius goes to VQ8AC, whose correct address is Supreme Court, Port Louis, Mauritius; first in Rumania is Anatol Poruznik, YR5AP .. .. .. A W8 WAC record is claimed by W8BKP, with VK2FG, FA8BG, J2LL, G2IS, CE2II and CM2GA worked in that order between 6:35 and 8:05 a.m. on April 12th, 14 mc.—conservatively, 1 hour and 35 minutes .. .. .. Things have been coming along on 28 mc., with G6CJ WAC in 3 hours and 45 minutes, OK1AW and F8VS both WAC on ten, and G6DH achieving the first European 28-mc. 'phone WAC back on March 1st .. .. .. Byron Goodman, W1JPE—ex-W6CAL, who pulled a Winchell on us while pinch-hitting in this column last month, worked WAC and 48 countries in two-and-one-half months on coming to New England from the West Coast .. .. .. Incidentally, this pillar found holding an informal DX session over s.w. b.c. station W1XK at the Boston convention on April 18th a lot more fun than holding forth monthly in this department .. .. .. Especially



THREE ARGENTINE HAMS

Left to right: K. M. Sen, LU4AJ; Jose A. Vivares, LU1EP; and Jaime Testorelli, LU9EA.

(*Continued on page 86*)

OPERATING NEWS

Conducted by the Communications Department

F. E. Handy, Communications Manager **E. L. Battey, Asst. Communications Manager**

THE Annual A.R.R.L. Field Day is scheduled for the week end of June 6th–7th. Time to drag out the old portable, or indeed to revamp and build anew! No need to forego summer pleasures when the junk box probably contains most of the necessary components for inexpensive field sets of the practical and knock about variety. There are constructional and power supply suggestions in the account of last years' Field Day successes (September 1935 *QST*, pages 34–35). The tube line-up may be a 41 driving a 79 as per July 1935 *QST*, a lone 42 or 42-42 combination, the familiar 47-46, a 47-'10 rig, 71A's, or any one of a dozen other satisfactory combinations. Over half the field work reported last season was on the 3.5-mc. band; a third of all contacts were made on 7-mc., and some 12% were 56-mc. contacts. Although any amateur frequency may be used for the Field Day station entered for the event, we suppose these three bands will still be the popular choice. Portable and portable-mobile rigs offer utility and pleasure during the whole season, whether used week ends or for extensive vacation periods.

Skill, judgment, and training meet the most severe test when communication emergencies develop. The purpose behind the Field Day is to test equipment suitable for the job by an actual operating set-up, and attempts to establish communication with different points from the temporary field location. A high degree of interest is assured from the number of advance inquiries. Both clubs and individuals have requested advance information on the dates set for this year's outing to test portables. It has been suggested that "manufactured" contacts between the several transmitters of one gang entering a station are unethical. Only contacts between this station and the outside should count of course. Additional rulings on these points will be made next season if desired and necessary.

Many things are developed under field operating conditions that cannot be learned from any amount of arm chair experimenting. Field Days inevitably discriminate, showing what are the worthwhile features in arrangement, which the weak points, and enabling sets to be modified by practice as well as theory. Then too it is sometimes shown that the chap who is ordinarily very quiet at the club is after all the fellow who is on the job in putting up antennas and bringing home the bacon, literally and otherwise. On the other hand, onlookers show up who accomplish nil except to hold down a campchair. But Field Days naturally develop the knowledge and operating "savvy" of all who enter. Whatever one puts into organization effort comes back to him in proportion to the efforts made.

The Field Day gives opportunity for all to get acquainted, to coöperate in establishing a communicating station, as well as to work out incidental arrangements about food and transportation. Besides adding to our store of practical knowledge, if your experience is anything like ours, you are assured of happy and lasting recollections of the experiences shared with others. A camera added to the equipment insures a record of the history-making expedition which can be used for comparison with other A.R.R.L. Field Days. With us these trips to different points each year stand out as high spots in interest.

Even though the communication achievements of the station you enter in the F.D. may be modest, each set-up that leads to success in establishing communication with amateurs at a distance may well cause you to thrill with the pride of actual accomplishment . . . for having done it once, it becomes easier to set up and get going in less time, and operate with greater efficiency should actual emergency ever require!

Amateur radio is a many-sided hobby. If used only as a plaything, ham radio addicts may find their hobby uninteresting. Novelty seekers find that thrills wear off in accordance with the old saw, that familiarity breeds contempt. But by using our competitions to build our ability in different constructive unselfish fields it is not necessary to allow our work to make us sophisticated or permit our hobby to pall. The confirmed and successful brother in our fraternity of amateur radio finds new experiences through new attempts and daily results. New services to perform for others, latent abilities in operating and building to develop, new messages, new contacts, new friends, new circuits, new DX . . . these represent the fullness of amateur radio. There is solid and lasting satisfaction to be found in amateur radio where the operator aims not to

operate on the "formula" plan but to tie his construction and brass pounding performance to something definitely useful to others. We commend the Field Day to your attention as one of our League-sponsored activities which has not one but several interesting and valuable objectives.

The fun of an outing is combined with the idea of an annual testing of portables, training operators for readiness in communication emergencies. Fraternalism and good feeling prevails. See what *you* can do. Few folks know their capabilities until they try. Take part with your local club, make up a group of local hams, or go by yourself. Anyway drop us a line as to your experience or results in the F.D., whether large or small. Here's luck in the Field Day. Remember, if you make one *bona fide* field contact you *win* . . . over the chap who didn't try!

— *F. E. H.*

The article by Mr. Robinson, W6FVD wins C.D. article contest prize this month. Each month we print the most interesting and valuable article received marked "for the C.D. contest." Contributions may be on any phase of amateur operating or communication activity (DX, 'phone, traffic, rag-chewing, clubs, fraternalism, etc.) which adds constructively to amateur organization work. Prize winners may select a 1936 *Handbook*, six logs, six message files, six pad blanks, or equivalent credit toward other A.R.R.L. supplies. Send your contribution to-day!

—*F. E. H.*

Paradise Postponed

By James M. Robinson, W6FVD *

EACH ham will one day depart this troubled world for eternal happiness in the World Beyond. Although the future beckons brightly, most of us choose to defer our departure. We wish to enjoy completely this life before taking the road to the sky. With this thought in mind let's consider some hazards around our ham shacks which may cut short our earthly lives. Recent months have brought prices of high-power tubes and apparatus to levels within the reach of hams of moderate means. Increasing accidents in recent months indicate that many fail to consider the nature of high voltage, and neglect to treat it with due respect.

A young boy was recently heard to remark something about putting 3000 volts on the '52's. Contrast his nonchalance with the following order issued by a typical power system. "At no time shall a journeyman electrician work on circuits of over 750 volts unless he is assisted by another journeyman, or an apprentice of at least 3 years experience." On the same system all live parts are enclosed to a height of 8 feet above the floor. Work is supervised in all cases by a foreman of several years' experience. A safety engineer trains each man to safe methods, and requires him to practice reviving his fellow worker in case of shock. Death still strikes, in spite of these and many other safeguards, though much less frequently than when more haphazard methods prevailed.

Commercial transmitters have dead fronts, with live parts enclosed with doors. Opening any door shuts off the primary power, which cannot be reapplied until all doors are closed. Relays open, in case of a flash-over, and fuses blow when a relay fails to operate. Most of us are not in a position to duplicate these, but cleaning up haywire is cheap. Having dangerous parts enclosed by baffles, or well up out of reach, costs nothing. A clear space around the rig helps a lot, as does a wooden floor. Little things like exposed jacks, tuning dial screws, receiver type plugs, and meter adjusting screws are ever waiting a false move. Many electricians put one hand behind them, or in a pocket when working on hot stuff.

Many hams value the big bottles in the final almost as dearly as life itself. One of those cute little fuses in the transformer center-tap will go a long way in protecting both. It isn't pleasant to think of roasting across a tank circuit with the power on. Under such conditions even 110 volts kills quickly. A red light, which may be seen from all sides of the rig when the power switch is closed is a worthwhile gadget.

Don't leave the rig so the children can turn it on. Junior may decide to see if he can pull as big an arc off the final as Daddy does when trying to impress visitors. Our modern rigs are not very impressive. The flash and crackle of early wireless days are gone forever. We have left only mercury-vapor tubes, meters, and the magic lead pencil. Who can blame the OM if he draws a long arc for his guests? Yet that wicked looking r.f., plus d.c., will pass readily through both ends of the performer on its way to ground.

In these modern days artificial respiration should be universally understood and practiced. There is at least one authentic case where a lineman's wife revived him after he had been shocked into unconsciousness many miles from aid. It is done like this: Remove foreign bodies from victim's mouth, and see that his tongue falls forward. Turn the head to one side to rest on his forearm so the mouth and nose won't touch the ground. Extend the other arm forward. *Begin artificial respiration at once and don't stop until victim is revived or for at least two hours.* Have an assistant call the police or fire departments for an oxygen squad, also call the doctor. He should also loosen clothing around victim's neck and chest, and put blankets as well as hot water bottles or bricks around him. The body cools rapidly after respiration stops. Kneel, straddling the thighs and facing victim's head. The palms of your hands are placed over the short ribs with your thumbs about two inches apart and parallel with the spine, fingers spread out with little fingers just below the last rib. *With arms held straight at the elbows*, swing slowly forward so the weight of your body is gradually brought to bear on the victim. This operation should be gradual and firm, but not violent lest injury is caused. The lower part of chest and also the abdomen are compressed and air is forced out of the lungs. Now slowly swing backward to remove the pressure but keep your hands in place, thus returning to starting position. The patient's lungs thus expand and fill with air. After about two seconds swing slowly forward again and repeat deliberately about fifteen times a minute the double movement of compressing and releasing. This causes a respiration about each four seconds or at the natural rate of deep breathing. Follow your own deep breathing if no watch is available.

We don't like to contemplate gruesome things, but just pause a moment to reflect what a tragedy to them, if one of your family, perhaps your mother, wife or child, found your unconscious body when they came to look for you. Familiarity does breed contempt. A good healthy respect for high-voltage is conducive to long life and a nice white beard, with time in old age to reflect on ham radio, back in the "Good Old Days."

* Halwee Power House, Olancha, Calif.

Ontario Hams, Attention! The Southern Ontario Radio Association of Windsor amateurs will donate the Essex County Brasspounders League Trophy to the station with the highest score in the Ontario Section of the League, participating in the Annual Field Day, June 6th–7th, this to be won twice consecutively for permanent possession.

Mr. Barron of the United Press, Los Angeles, went over to W6AM's shack to look over his emergency radio equipment. W6AM, a member of the A.R.R.L. Emergency Corps, displayed his 50-watt mobile rig, which is always installed in his car, and his other portables and associated gear. Then, sitting down at the 14-mc. 'phone, they raised W7ETN, Seattle, who telephoned the Seattle representative of U.P. and enabled the press men in the two cities to hold a fine conversation, mostly dealing with amateur radio in emergencies.

O.R.S. Trophy for '36–'37 Competition

To be Donated by Winston-Salem Club

The Winston-Salem Amateur Radio Club has long been ably represented by W4ABT W4RA and W4OG in these activities, and all club members take a well-deserved pride in the performance of station W4NC in all regular and special A.R.R.L. activities. At the Club meeting, February 14th, it was decided to donate a silver trophy for a future O.R.S. competition, this to be known as the "W4NC Trophy." In addition to this, all O.R.S. will be pleased to note the final plans worked up for a new competition year in which it is expected that the above Trophy will be awarded in addition to official A.R.R.L. recognition through a watch-charm medallion to the leading O.R.S. in each, the Pacific area, the central area, and the Atlantic coast area. These plans and photo of the W4NC Trophy will soon be ready for announcement. It's not too early to tip off all amateurs who could qualify for O.R.S. that they will be missing a whole lot if they don't get signed up in the near future to be eligible to get in on all the O.R.S. doings.

It is considered likely that the arrangements will place a 50% weighting on the traffic-operating record, with the other 50% credit toward a 100% total based on the contact record of the station in three quarterly tests, and the station design itself. This is mentioned now so that as much time as possible may be permitted for O.R.S. to perfect their break-in systems, install crystal switching, band-switching, and placement of controls for high station operating efficiency.

Line-up for O.R.S. Now

Invitation to all traffic men: you will find the new plans of vital interest to you, and we should be glad to have you an O.R.S. Regular bulletins cover the things you are interested in. O.R.S. are known to all hams as the most efficient reliable stations there are, with operators always ready for any communicating job, and upholding the traditions of amateur radio in every respect. The plans for the future give even more point to these features which you will want to support for the constructive aspects and good example to the inexperienced as well as for the direct benefits that accrue to you. Drop a postal to A.R.R.L. today for information on O.R.S. appointment.

Newly appointed "reliables" now included in the roster of O.R.S. are as follows:

W1ISN	W2GQX	W4DJV	W8EEQ	W9SWC
W1JDF	W2GSA	W4CYY	W8FWU	W9EAF
W1IQG	W2TX	W5DWW	W8LTT	W9PLL
W1ZQ	W2IYH	W5EXZ	W8NMD	W9GSH
W1IWC	W2CQA	W5FFK	W8DVL	W9RMN
W1HCH	W2HMJ	W5AZB	W8CMI	W9RSR
W1IKE	W2HNJ	W5FX	W8LY	W9BJH
W1HWE	W2IBT	W5FDR	W8DIG	W9OGZ
W1IKC	W2HYC	W6MDJ	W8JGJ	W9TQZ
W1GTX	W2HBO	W6DEG	W8HWC	W9OWU
W1DHX	W2BZJ	K6GAS	W8MBI	W9PYF
W1YK	W2HFT	W6BHF	W8UK	W9PXH
W2ING	W2FRF–IYS	W6NGK	W9TCB	W9IGW
W2GZS	W3FTK	W6CXK	W9UPW	W9MZD
W2HZJ	W3DSC	W6MTP	W9OUD	W9WFW
W2ICM	W3EUP	W6MQM	W9KCG	W9ONI
W2EBM	W3FBM	W6SG	W9AWH	W9JAW
W2HZY	W3KU	W6KNH	W9ODH	W9SZL
W2HBQ	W3EYO	W6HGL	W9CB	VE2JK
W2GTW	W3FKJ	W6EOP	W9EKQ	VE3ABW
W2HXT	W3WJ	W7CWN	W9PGG	VE3AEM
W2ECL	W4BYS	W7CFV	W9AEP	VE3PL
W2HRA	W4DEP	W7BHB	N9FHM	VE5JL
W2GMN	W4FX	W8ICM	W9OQC	

An amateur transmitter was in operation at the Automobile Show in Wildwood, N. J., April 10th–13th, inclusive. A total of 466 messages were handled. The transmitter, built by W3DOK, employed a Federal 175-watt tube in the final. Those responsible for this demonstration of amateur radio were W3CKW, W3BYR, W3DOK, W3DAU, W3DLZ, W3BOT, Mrs. W3DAU and H. Ward.

OBSERVERS' HONOR ROLL

Cairo Commercial Occupancy Survey For April 1936

6000–8000 kcs.

W9EFK	W1IJL	W6AF	W8DSU
W9CHH	W7DYH	W9BFC	W8IZD
W1BGJ	W9LEB	W9DIB	W8JZ
W. R. Faries	W98XL	VE3ACI	W8LVG
W9DCM	VO1C	VE3SD	W9CGC
W8NQ	W1ILR	VE4UN	W9CP
W5BWM	W3FLD	P. R. Randolph	W9DH
W4DNA	W5CVO	W1ASB	W9DQD
W9GMT	W8BFF	W2DBQ	W9GLG
W9UJZ	W8LVH	W3EWV	W9SYI
W1ABG	W9SJK	W5DLC	W9VBQ
W3FCQ	VE3SG	W6EGI	W9WKO
W9LDH	W2CSH	W6KFC	Mr. Allen
D. R. Bittner	W3DRO	W6LQY	Jas. C. Hayes
W8APQ	W3FEW	W6MQC	Chas. A. Russell

4000–4500 kcs.

W2JHB	W1ABG	W9DH	J. Hirsch
W7AAN-DRF	W2HCO	W1BMW	
W1BGJ	W8JQE	VE2KM	

New W.A.S. Members

In addition to the Charter Members listed in April *QST*, the following have now qualified for the Worked All States certificate award: Edward C. Nau, W8CMB; Norman Ward, W9EWU; Thomas Sue Chow, W6MVK; W. H. Bailey, W9FNK; Alice R. Bourke, W9DXX; Harold H. Smith, W2UL; Elmer F. Koehler, W9BEU; B. H. Hansen, W9GDB; A. W. Lundeen, W9PZI; John E. Wile, W8LAV; Gale Swift, W9IVD; Wm. M. Schoener, W8BZB; Dr. B. T. Simpson, W8CPC; Fred M. Kamp, W9KEI; Walter Peck, W1EFN (1ARH); John Bricker, W8IJZ; Eppa W. Darne, W3BWT; John Wittman, VE4OC; Gabriel J. Ulion, W8IFY; Vernon D. Penner, W2ECU; George C. Moldt, W7DRJ; Duane Magill, W9DQD; Lewis E. Elicker, Jr., W3ADE; Emil R. Felber, Jr., W9RH; R. U. Richmond, W7CRH; A. W. Kovatch, W8BYM; D. R. Sheehan, VE2DG; Francis Walton, W9ACU; C. F. Sawyer, VE4QZ; J. F. Seeley, W8ITK.

125 amateurs have now qualified for membership in the Worked All States Club. By districts, the number who have qualified is as follows: W1-7, W2-6, W3-11, W4-5, W5-7, W6-6, W7-6, W8-37, W9-34, VE2-1, VE3-2, VE4-2.

Garden City Club to Report Yacht Races

The Garden City Radio Club (Long Island) is making extensive plans to report by radio the yacht races to take place this summer in Long Island Sound. It is planned to have a 56-mc. rig aboard each yacht as well as suitable land stations to enable complete reporting of the location of all boats at all times. Each yacht club whose boats are participating will be provided with a large map on which the progress of the boats will be indicated. Several new transmitters are being designed by the club's technical committee under the chairmanship of W2GYL. On recent test one low powered unit installed in the trunk of an automobile maintained practically constant communication with W1EER, Noroton Heights, Conn., throughout a trip from Bridgeport, Conn., to New York City. Using another small rig at the Club's station, W2DKJ, located 927 feet above the street at 40 Wall Street, New York, contact was established with W1EYN, Fairfield, Conn., and continuous communication maintained for over a half hour. The Garden City Club has placed the work of organization for the yacht races in the hands of Edwin Ruth, W2GYL (heading a technical committee); Curtis Arnall, a member of the City Island Yacht Club, skipper of the *Truant* and the man responsible for the original idea; Arthur W. Lynch, W2DKJ; Dr. Dunn, W2CLA; and the club secretary, S. P. McMinn, W2WD.

BRASS POUNDERS' LEAGUE

(March 16th–April 15th)

Call	Orig.	Del.	Rel.	Total
W8JTT	16	13	1880	1909
W3FTK	50	41	1498	1589
W2BCX*	43	112	1411	1566
W1AKS	88	95	1149	1332
W2BCX	22	60	1243	1325
W1FFL	109	82	920	1111
W3BZP	59	54	978	1091
W8LSF	54	38	862	954
W9AIJ	278	60	581	919
W1HPI	212	322	372	906
W1KB	420	280	200	900
W1ICS	279	111	420	810
W9ESA	60	142	568	770
W9LCX	44	28	659	731
W5CEZ	72	107	542	721
W7KL	204	55	451	710
K6FKB	244	282	154	680
W9FAM	29	16	618	663
KA1DS	94	436	107	637
W2EGF	38	28	570	636
W3BWT	81	86	460	627
W8MOT	13	30	581	624
W8INE	78	204	330	612
W8KUN	31	32	547	610
W3APV	12	24	563	599
W3EOP	49	9	524	582
W3EBP	5	46	528	579
W9PTU	30	13	521	564
W5MN	27	246	288	561
W8RN	121	56	380	557
W3VR	32	29	488	549
W2GGW	37	47	456	540
W2HYC	76	18	442	536
W8OFO	10	40	481	531
W3CIZ	32	109	371	512

MORE-THAN-ONE-OPERATOR STATIONS

Call	Orig.	Del.	Rel.	Total
W4CQD	2217	1	—	2218
W9BNT	298	1137	569	2004
KA1HR	636	334	512	1482
W4BBV	198	38	566	802
W3CXL	49	73	494	616
W1DCW	—	13	537	550

These stations "make" the B.P.L. with *totals* of 500 or over. Many "rate" extra credit for one hundred or more deliveries. The following one-operator stations make the B.P.L. for *delivering 100 or more messages;* the number of deliveries is as follows: Deliveries count!

W6GHD, 211 — W1BDI, 114 — More-than-one: KA1US, 142 — W1BFT, 104 — W1HWZ, 210 — W1FIO, 131 — W4IE, 102 — W1AWW, 127 — KA1EE, 102

A.A.R.S. STATIONS

Call	Orig.	Del.	Rel.	Total
WLNF* (W2BCX)	32	39	659	730
WLQA (W3OK)	30	28	649	707
WLVH (W6BMC)	4	15	565	584
WLNF (W2BCX)	13	29	507	549
WLQB (W3EOP)	6	23	502	531

MORE-THAN-ONE-OPERATOR STATIONS

Call	Orig.	Del.	Rel.	Total
WLM (W3CXL)	135	396	1951	2482
WLMI (W6GXM)	196	242	668	1106

A total of 500 or more, or just 100 or more *deliveries* will put *you* in line for a place in the B.P.L.

* February–March.

Summary, 1.75-mc. Transatlantic Tests

This summary of W/VE results in the 1936 1.75-mc. Transatlantic Tests, covering sixteen different tests between January 25th and March 15th, has been compiled by Stewart S. Perry, W1BB, leading W participant. Contacts made by each station (figures after the calls indicate number of contacts made on *different* test dates): *By W1BB:* G2DQ-14, G2II-11, G2IN-1, G6PF-2, G6YQ-1, G6GL-2, G6WQ-1, FA8BG-1, EA4AO-1. *W1OR:* G2DQ-2, G2II-1. *W1ADF:* G2DQ-1. *W1GBD:* G2DQ-1, G2II-1. *W3UK:* G2DQ-2, G2II-3, G2IN-2, FA8BG-1. *W8UV:* G2DQ-4, G2II-1. *W8BDV:* G2DQ-1, G2II-1. *W8OKG:* G2DQ-1. *VE1EA:* G2DQ-4, G2II-2, G6UJ-1. Calls Heard by W/VE operators (figures indicate number of times heard on *different* test dates): *By W1BB:* G2DQ-14, G2II-11, G2IN-2, G6WQ-1, G6PF-2, G6YQ-1, G6GL-2, FA8BG-1, EA4AO-2. *W1OR:* G2DQ-3, G2II-3. *W1ADF:* G2DQ-1. *W1GBD:* G2DQ-6, G2II-4, G2IN-1, G6WQ-1. *W3UK;* G2DQ-5, G2II-4, G2IN-3, G6WQ-3, G2XC-1, FA8BG-1. *W8BFA:* G2DQ-10, G2II-7, G2IN-2, G6WQ-2. *W2ILI:* G2DQ-2, G2II-2. *W3EMM:* G2DQ-1. *W3EVI:* G2DQ-1. *W8UV:* G2DQ-7, G2II-3, G2IN-1. *W8BDV:* G2DQ, G2II. *W8OKG:* G2DQ-3. *VE1EA:* G2DQ-5, G2II-4, G2IN-1, G6UJ-2.

Complete list of W/VE stations known to have participated in the tests: W1BB OR ADF BKL BFT BMW GBD BKH W2UK BDB BFA EQS HBA HUG ILI W3EMM EVI FDE W5BD DHU W8UV ASI BDV GPP GWW NWT OKG VE1EA VE3JO US XX VE5AV.

The phenomenon first observed in the 1935 tests and noted in *QST* by G2II, that is, the rapid increase in signal strength of signals at about sunrise time GT, was again noted this year by many stations. Several of the G's worked by W1BB and not heard or worked by other W/VE's were nabbed on the crest of this wave. It was extremely interesting to hear a weak signal come from behind the background suddenly increase to RST 449 peak, and then fade out again suddenly. The duration of the peak was usually from five to twenty-five minutes. W2UK, working FA8BG on 28 mc., made a schedule for 1.75-mc. contact, which resulted in the first W. Africa 1.75-mc. QSO on record! W1BB hooked FA8BG the following night. Coöperation was generally splendid throughout the tests and all in all things went off smoothly. A blue printed copy of a complete test log as compiled by W1BB and containing more details is available from him for cost of printing and mailing.

The Festival of States

The St. Petersburg (Florida) Amateur Radio Club, in coöperation with the Junior Chamber of Commerce, handled over 2000 messages for visitors to the annual Festival of States, the week of March 28th–April 4th. A station was set up in a central location with a suitable sign across the front of the building housing the equipment. The apparatus consisted of a Skyrider receiver loaned by W4DBG, a 3.5-mc. transmitter and receiver loaned by W4CQD, R.M., and a rack and panel 'phone-c.w. rig loaned by W4BCZ, S.C.M. W4CQD managed the traffic activities and did a fine job of it. W4APU, Director, Southeastern Division A.R.R.L., handled much of the traffic from the Festival. A special DX message for Australia was handled direct to its destination by W4ANH. Many visiting hams were welcomed at the station and special credit is due W8MKI for assistance in operating when club members were unable to be present. The effect of the exhibit was to give the public a new conception of what amateur radio really is—other than "the pest next door who causes all the QRM".

—*W4BCZ, S.C.M., Eastern Florida.*

DX Notes

FROM W9HUV and W9ELA comes the information that ex-CT2BK is now on the air in Bolivia signing CP1AA. He will be found in his old CT2BK spot, "right on the edge," 14,000 kc. or on 14,450 kc. . . . A unique four-leg 'phone contact took place on March 8th. VK2BQ, Sydney, Australia worked G6XQ, G6XQ worked KA1AN, KA1AN worked G5NL, G5NL worked back to VK2BQ. This QSO lasted 40 minutes and was 100% readable all around. . . . ZL2JU advises that QSL cards for GTCP, the S.S. *Thistleglen*, may be sent to the operator, R. R. Rogers, 50 Holloway Road, Holloway, London N. 7. . . . Another four-way, on April 6th: D4ARR-LU1EP-ZL1DV-W6JPW. This lasted an hour and a quarter, D4ARR acting as "master of ceremonies," each reporting to him and then in turn QSOing with each other. . . . A real record WAC—44 minutes by W6KRI! The stations were J5CE, ZT1Q, VK3VW, YV2AV,

W5COU, ON4AU. . . . FB, OM! . . . XE2N advises via W1JUD that, due to the extremely large demand for QSL's from him, he can no longer send any QSL's unless the requests are accompanied by an international coupon to cover the cost of postage. . . . W3BGD was QSO a station signing COO and giving QTH as Kaunas, Lithuania; frequency was 7300 kc.; has anyone any authentic dope on this one? . . . ZS1AH, via W9EWU, sends word that he wants to schedule VE1, VE4, VE5; his frequency is 14,270-kc. . . . W8ACY/W2ICE reports ex-EZ4SAX/ex-TS4SAX of Saar Territory, now signing B4QET on 14 mc.; he is heard daily at 2100 GT. . . . K6KSI, Guam, is reported heard at 1:00 a.m. EST, about 14,100 kc., by W3DBD. . . . ZC6CN is tearing through on 14,440 kc., T7, usually in from 10 p.m. *until 1:00 a.m., says W4CCH; he also reports U9MF* QSO'ed and coming through regularly from about 8:30 to 11:00 p.m., 14,410 kc., T9X. . . . W6HMW, member of the U.S. Marine Corps, has been transferred to China, where he will be active in ham activities, either from XU8NA (Marine Corps station) or other stations; he promises a QSL to all W's worked. . . . W6CMG worked UoLC from 3:05 to 3:30 a.m. PST on April 25th; UoLC was on about 7100 kc., T7. . . . ON4CJJ, Belgian Congo, is coming through on 14,370 kc.; he was worked by W3EYS May 6th, 0620 GT. . . . W4CEN made WAC in 3 hours, 15 minutes on April 8th; the stations: FA8SR, ON4MY, U9AL, LU1EP, W6MLM, K6NLD. . . . W8IQS was QSO ZS1H on 28-mc. 'phone at 12:15 p.m. EST, April 4th; ZS1H was using c.w. . . . . W1DUJ, Warren, Maine, worked VS6AX, 9:10 a.m., March 8th . . . was this the first VS6-Maine contact, he asks? . . . W2HWS heard AC4AU, Tibet, and K6BAN on 14-mc. 'phone one morning around 10 a.m.; AC4AU's frequency: 14,273-kc., K6BAN's 14,194-kc. . . . VK2UC, VK2AZ, VK2JU, VK2ABD, VK3HK and VK5NI are heard daily at 7 a.m. EST on 14-mc. 'phone. SU1CH is putting through an R7 signal on 14,300-kc. 'phone.

Briefs

From W5EHM, Dallas, Texas, comes the report that on the night of April 30th from 8 to 10 p.m. CST unusual conditions prevailed on 56 mc. Starting at about 8 p.m. W9's were heard; at 9:25 p.m. a W8 was heard testing. All signals were fading rapidly. The stations believed heard were W9CFE, W9CSB, W9EWO, W8EGE, W9EEI, W9UHU, W9EUZ, W9AEQ, W9RQT; W9AEQ being the best heard; he and W8EGE peaked at S8, rest up to S7. W5EHM is not certain of the calls due to short sign-offs.

W3MG received two rush messages for Washington, D. C., and Richmond, Va., from K4AAN on 14-mc. at 4:05 p.m. *At 4:15 p.m. he changed to* 3.5 mc. and raised W3BNH, Richmond. At 6:35 p.m. he raised W3ER, Washington. Nice QSP's!

W3EOZ, Eastern Pennsylvania 'Phone Activities Manager, reports 14-mc. phone conditions excellent. He was contacting VK2AS, VK2NO and VK2TC recently while W1FVO was also listening to the Australians. W1FVO called VK2NO, made contact and gave him a message for W3EOZ. A few minutes later VK2NO passed the message to W3EOZ. "Around the world circuit" used to cover a desired distance of 200 miles!

San Francisco Emergency Plans

The San Francisco Radio Club, the Associated Radio Amateurs, is closely coöperating with the Disaster Relief Committee and has set up an excellent plan of communications whereby emergency power will be supplied from a mobile gasoline driven 60-cycle alternator for contacts outside the city. Within the city 56-mc. mobile and portable rigs will provide a city-wide network to feed the main station and to tie in relief agencies and concentration points with the central committee.

An unusual four-way hook-up was in operation on 14-mc. c.w. from 10:00 to 11:15 p.m. one night recently. The stations concerned were D4ARR, LU1EP, ZL1DV and W6JPW.

On April 7th, the day of the crash of the T.W.A. *Sun Racer*, Mayor Ellenstein of Newark, N. J., phoned W2GVN and W2HNP to inquire if they could get any information regarding his wife, who was aboard the plane. W2GVN made contact with a W8 in Ohio and W2HNP with W8MUQ Elmira, N. Y. From these fellows it was ascertained that Mrs. Ellenstein was one of the two passengers saved. Later, in conjunction with the A.A.R.S., W2BCX, W2GMN and W8MOT were able to get more detailed information.

An amateur station exhibit was conducted on April 23rd at the Mission Covenant Church in Austin, Chicago, under the supervision of W9TLQ and the auspices of the Northwest Radio Club of Illinois. The exhibit was the greatest attraction in a "Men's Hobby" show. More than 800 visitors viewed the station. Operation was on 14-mc. 'phone under the call W9ONR.

Oklahoma Police Net

Organization of a Police Net is being completed in Oklahoma. The following stations and towns are working in the net through daily schedules, operating on different frequencies and contacting by the schedule method rather than in a directed net. W5AMT, Duncan; W5EXZ, Wynnewood; W5FX, Pauls Valley; W5CSU, Tulsa; W5DZU, Edmond; W5ERM, Prague; W5FFK, Seminole; W5ADC, Wetumka; W5CEZ, Ponca City. W5CEZ, Oklahoma S.C.M., would like to hear from other states having a police net working. W9FLG, Kansas S.C.M., is working on a Police Net in his state.

W9FWY writes concerning the "Kansas Cyclone Network"; "First, the meaning of the name. A cyclone is a lot of hot air going around and 'round. When this bunch gets together on 1.75-mc. 'phone almost any noon, the average cyclone becomes a mere zephyr by comparison. There are no regular scheduled meetings, no officers, no dues. Any active amateur can become a member, although most of the stations at present operate on 1.75-mc. 'phone. One 14-mc. 'phone is active in the group, W9EKN, Manhattan, Kansas, who is relayed onto 1.75 mc. by W9FWY. Some of the network members and their "monickers": W9ECF, The Old Man with the Long Grey Beard; W9UWN, The Village Barber; W9DSR, The Greenleaf Greasemonkey; W9GQA, The Kansas Windjammer; W9AEF, The Lonesome Farmer; W9HTT, The Windy Plumber; W9RXJ, The Brass Voiced Tenor; W9FWY, The Terrible Swede."

"Ten per cent of the fun in traffic handling comes from serving the public. Ninety per cent of the thrill comes from watching your operating skill increase rapidly and surely due to the constant practice. O.R.S. and O.P.S. know that 'he who serves others, serves himself.' Is *your* ABILITY as good as your EQUIPMENT?"—W3EZ, E. Pa. S.C.M.

Attention, Pittsburgh Amateurs!

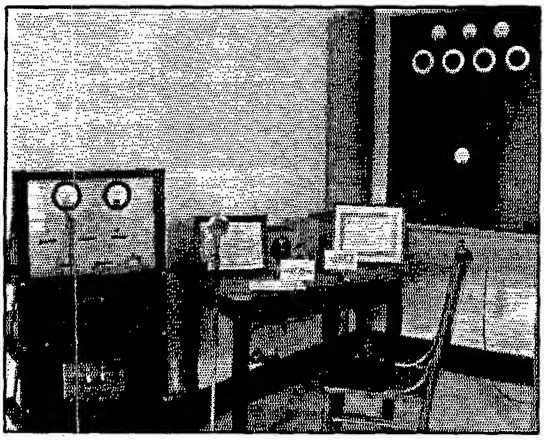
Harmon W. Armstrong, W8BBV, assistant secretary of the Amateur Transmitters Association of Western Pennsylvania, suggests that amateurs in the Pittsburgh area organize a permanent "Emergency Communications Unit," such a unit to be so designed as to be of the greatest possible assistance to all other organized emergency agencies. W8BBV suggests that the unit consist of amateurs who have fixed stations in favorable locations, those who have portable equipment, which could be used in the field, and amateurs who would act as operators. Arrangements would be made with local companies who have portable gasoline driven generators to loan them for emergency use. It is W8BBV's idea that the A.R.R.L. Field Day be used for a "field-training period" for the unit. Many details must be worked out and W8BBV asks all amateurs in the Pittsburgh area to think it over and let him have their views. He may be reached at any A.T.A. meeting, by mail care of U. S. Engineer Office, Post Office Building, Pittsburgh, or by telephone, Grant 0800, ext. 278.

Don't ever tell OA4J that hams don't QSL—he won't believe you. The first mail after the DX contest brought him *118* QSL cards . . . and the second mail brought 124 more!! Let's move to Peru!

Originate Traffic

Every so often a traffic man will be heard griping over the scarcity of traffic. This is natural, of course, since traffic is to the traffic hound what butter is to bread. However, I often wonder if it never occurred to these lads to *originate* traffic. That is one sure way to create something to handle! Why not each ham send as many messages as he can to friends, relatives, other hams, etc.? I don't mean originate any old kind of traffic—but originate good, non-rubber stamp messages. There must be plenty of hams who have never originated a single message. Just think of the amount of traffic there would be, if every active ham originated but one message per month! Being a traffic man myself, I can deplore lack of traffic, too, but before we wail too much, let's *boost originations!*

—*W8DNU, O.R.S.*



STATION OF THE ST. PETERSBURG (FLA.) AMATEUR RADIO CLUB, WHERE MESSAGES WERE HANDLED FOR VISITORS DURING THE ANNUAL FESTIVAL OF STATES WEEK

Real Coöperation!

During the serious illness of W5UF's grandmother, which lasted for a period of some three weeks, it was desired that some of the family living in Shreveport, La., and Dallas, Texas, be kept posted daily as to her condition. W5UF, who is located in Waco, Texas, received the whole-hearted cooperation of W5DWW, Shreveport, and W5DVB, Dallas, who maintained daily schedules with him at 2:00 and 4:00 p.m. respectively over the entire period. W5UF says, "These fellows were never late, even *one minute*, they handled messages both ways without a repeat or mistake daily, efficiently. . . . I think the organization as a whole should know of their splendid work."

W1INF O.B.S. Schedules

These are sent from A.R.R.L. Hq., W1INF, as follows (all times EDST): New broadcast starts each Thursday, 8:30 p.m. (13 w.p.m.), 10:30 p.m. (22 w.p.m.); Friday, 8:30 (22 w.p.m.), 10:30 (13 w.p.m.); Sunday, 8:30 (13 w.p.m.), 10:30 (22 w.p.m.); Monday, 8:30 (22 w.p.m.), 10:30 (13 w.p.m.); Tuesday, 8:30 (13 w.p.m). Frequencies used: Monday and Tuesday: 3575-kcs.; Sunday, Thursday and Friday: 3825-kcs.

Florida 1.75-mc. 'Phone Emergency Net

This particular emergency net operation followed the November 4th hurricane, which almost completely flattened Miami and neighboring towns. Communication systems as usual were all down and amateur radio again solved the problem.

In addition to local telephone systems being out, the Fire Department was without any means of communication with the nine substations. The alarm, telephone and bell signal systems were all out of commission. This is a grave situation, especially following a hurricane when regular means of cooking and heating are temporarily disrupted and open fire used by many of the outlying districts. To cope with the constant danger of fire spreading before alarms could be spread the Chief called on Miami amateurs for aid.

W4CNA was authorized to operate portable, with substations at the various fire stations without telephone or alarm. Contact with sub-stations was made on the night of November 4th and the next day several other stations were set up until there were finally six stations in the net all working on 1.75-mc. 'phone, some on emergency gas generator supplies, others on batteries. This work terminated on November 10th at 9:30 p.m. when telephone system was completed.

The following amateurs furnished their services and equipment for this duty: W4CKD, W4DER, W4CNA, W4AON, W4ANP, W4CFC, W4AKI, W4DMY, W4CWW, W4CXB, Pop Hale, USNR, W4DMW, W4DNF, W4BQR, W4BVX, W4BQX, W4BXL, W4BWX, W4EH. Clubs coöperating were the Coconut Grove Amateur Radio Club and the Miami Amateur Radio Club.

—*Geo. F. Klein, W4CNA, M.A.R.C.*

The Reseau des Emmetteurs Francais invited the radio amateurs of the world to join with them on Armistice Day, November 11, 1935, in observance of a "silent minute." At precisely 1100 GMT every amateur was urged to stop keying or modulating his transmitter for one minute, this silent period being traditionally spent in homage for the heroes of the great war. This was the second year that R.E.F. observed this ceremony.

A unique message delivery service: W8LZE gave W8ITR an urgent death message for N.Y.C. "CQ Urgent NYC" was called and W2IAS, Jersey City, N. J., was raised. W2IAS then called his local police, who sent the message by Teletype to the N.Y.C. Police. In less than ten minutes after W2IAS gave W8ITR the "OK," a New York police cruiser, having received the message by police radio from headquarters, delivered the message to the addressee!

Add to W9FO's "Radio Crew," one of the most important essentials: Tune, W8LZE.

W6MNC, Downey, Calif., is transmitting code practice on 1784 kcs. each Monday, Wednesday, Thursday and Friday from 7:00 to 7:45 p.m. P.S.T. Transmissions for the first 15 minutes are at 5 words per minute, second 15 minutes at 8 w.p.m., third 15 minutes at 12 w.p.m.

Says W3QP, "In the case of the telephone company, the 'phone band' is the strap that goes around the operator's neck to hold the mouthpiece!"

ELECTION NOTICES

To all A.R.R.L. Members residing in the Sections listed below:

(The list gives the Sections, closing date for receipt of nominating petitions for Section Manager, the name of the present incumbent and the date of expiration of his term of office.) This notice supersedes previous notices.

In cases where no valid nominating petitions have been received from A.R.R.L. members residing in the different Sections in response to our previous notices, the closing dates for receipt of nominating petitions are set ahead to the dates given herewith. In the absence of nominating petitions from Members of a

Section, the incumbent continues to hold his official position and carry on the work of the Section subject, of course, to the filing of proper nominating petitions and the holding of an election by ballot or as may be necessary. Petitions must be in Hartford on or before noon of the dates specified.

Section	*Closing Date*	*Present SCM*	*Present Term of Office Ends*
Los Angeles	June 1, 1936	Howell C. Brown	June 14, 1936
Iowa	June 1, 1936	Phil D. Boardman	June 14, 1936
Nebraska	June 15, 1936	S. C. Wallace	July 1, 1936
Philippines	June 15, 1936	N. E. Thompson	Mar. 15, 1936
Utah-Wyoming	June 15, 1936	Arty W. Clark	Apr. 16, 1936
Hawaii	June 15, 1936	Atlas O. Adams	Apr. 23, 1936
Oklahoma	June 15, 1936	Carter L. Simpson	Feb. 15, 1936
Western Massachusetts	June 25, 1936	Percy C. Noble	July 6, 1936
Illinois	June 25, 1936	Fred J. Hinds	July 6, 1936
Indiana	July 10, 1936	Arthur L. Braun	July 19, 1936
Ohio	July 20, 1936	Robert P. Irvine	Aug. 8, 1936
Oregon	Aug. 3, 1936	Frank L. Black	Aug. 15, 1936
Eastern Florida	Aug. 3, 1936	Philip A. McMasters	Aug. 15, 1936
Santa Clara Valley	Aug. 3, 1936	Charles J. Camp	Aug. 15, 1936
Kentucky	Sept. 1, 1936	G. W. Mossbarger	Sept. 8, 1936
Mississippi	Sept. 1, 1936	J. H. Weems, Jr.	Sept. 6, 1936

* In Canadian Sections nominating petitions for Section Managers must be addressed to Canadian General Manager, Alex Reid, 169 Logan Ave., St. Lambert, Quebec. To be valid such petitions must be filed with him on or before the closing dates named.

1. You are hereby notified that an election for an A.R.R.L. Section Communications Manager for the next two year term of office is about to be held in each of these Sections in accordance with the provisions of By-Laws 5, 6, 7, and 8.

2. The elections will take place in the different Sections immediately after the closing date for receipt of nominating petitions as given opposite the different Sections. The Ballots mailed from Headquarters will list the names of all eligible candidates nominated for the position by A.R.R.L. members residing in the Sections concerned. Ballots will be mailed to members as of the closing dates specified above, for receipt of nominating petitions.

3. Nominating petitions from the Sections named are hereby solicited. Five or more A.R.R.L. members residing in any Section have the privilege of nominating any member of the League as candidate for Section Manager. The following form for nomination is suggested:

(Place and date)

Communications Manager, A.R.R.L.
38 La Salle Road, West Hartford, Conn.

We, the undersigned members of the A.R.R.L. residing in the.....Section of the.....Division hereby nominate.....as candidate for Section Communications Manager for this Section for the next two-year term of office.

(Five or more signatures of A.R.R.L. members are required.)

The candidates and five or more signers *must* be League members in good standing or the petition will be thrown out as invalid. The complete name, address, and station call of the candidate should be included. All such petitions must be filed at the headquarters office of the League in West Hartford, Conn., by noon of the closing date given for receipt of nominating petitions. There is no limit to the number of petitions that may be filed, but no member shall sign more than one such petition.

4. Members are urged to take initiative immediately, filing petitions for the officials for each Section listed above. This is your opportunity to put the man of your choice in office to carry on the work of the organization in your Section.

—F. E. Handy, Communications Manager

ELECTION RESULTS

Valid petitions nominating a single candidate as Section Manager were filed in a number of Sections, as provided in our Constitution and By-Laws, electing the following officials, the term of office starting on the date given.

Vermont — Alvin H. Battison, W1GNF April 15, 1936
Southern Minnesota — Webster F. Soules, W9DCM April 16, 1936

In the Montana Section of the Northwestern Division Mr. Russell U. Richmond, W7CRH, and Mr. O. W. Viers, W7AAT, were nominated. Mr. Richmond received 55 votes and Mr. Viers received 27 votes. Mr. Richmond's term of office began March 13, 1936.

Station Activities

CANADA

MARITIME DIVISION

MARITIME—SCM, A. M. Crowell, VE1DQ—The following news comes via 1GL: BZ is still away getting along FB with VP gang. DB is working as engineer on the tug "Balley." BL is still trying to get receiver working. HX is getting good reports on 7 mc. EY is building new superhet. IA is getting out FB on 7 mc. with flea power. FT is QRL work and YL. CO is working Australia regularly on 28- and 14-mc. 'phone. AP is sticking mostly on 7 mc. AF has Class B rig on 3.9-mc. 'phone. BE is putting a pair of tens in the final for 3.9-mc. 'phone. AC is having a good time on motorcycle. BD has new Class B 'phone on 14 mc. FR has all-battery rig working FB. CW is doing good work in 3.5 mc. with low power. JG is busy at CHGS. EX is looking for W.A.C. QSL's. GU handles the traffic report for North Minto this month. CJ is back on the air. HJ has FB Class B mod. FLASH—HK had his tonsils out and came out of the anaesthetic yelling "73 73 73:" Hi! IV is getting sail boat ready for yachting season. Don't fail to report because you don't handle traffic. Report *all* your activities and do it by radio. Let's hear about that 56-mc. activity, etc. Keep the column alive. Moncton news by 1EV: DC is building new rig for 56, 28 and 14 mc. GI won 7-mc. crystal raffled off by M.A.R.C. GS has 56-mc. rig going FB. CX is building 59 tri-tet plug-in oscillator unit. IL transferred to new QRA. IK is active on 56 mc. with beam. DI is rebuilding breadboard style with pair of '46's final. FF is new ham in Moncton; Morse opr. GP is on 14- and 3.9-mc. 'phone. IR is active on 14 mc. with TNT-P.P. '45's. The Moncton Club plans on putting on the Hamfest this year.

Traffic: VE1ER 105 HH 17 IV-GU 4 CJ 1 GL 90 BH 1.

ONTARIO DIVISION

ONTARIO—SCM, John Perdue, VE3QK—R.M.'s: 3TM, 3WX, 3QK, 3DU, 3GT, 3SG, 3GG. VD reports plenty of DX on 7 mc. DU can't keep outta the hospital . . . tonsils this time! IB is doing some FB work for a troop of Boy Scouts on the radio angle of their training. GT, on 14 mc., is working DX right and left with 10 watts to an '03! CG tells us that PC is now heard from Camp Borden. GG is gonna take a vacation and let son Len at KH take over his schedules since he is back from school in the U.S.A. FW is on 14 mc. ADP is feeding T.L. "I" with a host of traffic from the Northland. ACW has left Iroquois Falls in favour of VE1 sumpin in New Brunswick. GN has his eyes on a Skyrider or an FBXA. UA has YL trouble again. BB is rebuilding with '03A in final and is a brother to the GG-Man. MB was visited by VE2AR, 3UO, XS, FL, 3AHR and family who all condole Whit on the loss of a couple of 82's and a flock of bakelite sockets plus several fuses. EM brags about some FB DX work with ZL's. AEM cancelled all schedules for the summer. EA writes that WH leaves the railroad long enough to squirt a CQ now and again, that AAP is about to disembark for some opping on the Lakes this season, and that VW and GF ask the gang to keep an eye open for them on 3.5 mc. from Midland. NC does some enviable DX work on 14-mc. 'phone. WV is active on 14- and 3.9-mc. 'phone with a goodly bunch of DX to his credit. AE still schedules on 7 mc. WX, RO and AHK were seen at a Dog Show . . . and then at a lumber yard buying a telephone pole for QK, who also was at the Pup exhibit . . . too long, say they! WK figures on scheduling all summer long and wants a connection in Windsor or Detroit between 7:15 and 7:45 a.m. . . . he may be found on 3840 kc. IK handled an urgent message for QK and did a swell job of it . . . half credit goes to BF who was on the delivering end. LM and XA are casting eyes on 'phone jobs. FQ and LY are bound for 28 mc. GB has just returned from a visit with some W6's. AAV is getting magical results from indoor antenna. BV is having trouble with key clix. RA uses crystal lock system with a pair of '10's on 14 mc.!! GS and FW are open for 7 mc. schedules. QB was visited by MX and VO—AF and showed 'em how a 201 base and 171 amp. perks during their stay with a chat with CM2AF!!! QB also is anxious to get rid of some odd 200 foreign QSL's . . . send a self-addressed envelope to him, all youse lads and lassies . . . his QRA will be found elsewhere under QSL managers roster . . . by the way, IB is assisting Bert very nobly in Toronto and vicinity and would be glad to have a call from any DX hound in the Queen City. ABW has been QRL new ten tube "sniggle sniggle" . . . and QH is fed up with his'n. JU has a gorgeous new 14-mc. rock. CC is now quite rightfully deserving of his allocated "handle." VZ represented ham radio at the Hamilton Westdale Technical School Exhibition. Mr. "X" wants to meet KM up a dark alley! NX, KM and FP keep things on the up and up in OFN activities. PL is very QRL. Who's gonna win the S.O.R.A. Field Day Trophy? Memo to GT: don't forget June 14th. 73 and what sorta filter do you guys use for a "slice"?

Traffic: VE3QK 220 ABW 146 GG 115 AEM 108 WX 82 WK 55 IB 46 VZ 43 PL 42 DU 30 TM 16 SG 14 AE 9 NC 8 VD 4 YY-EM 2 BF-IK-QB 1.

QUEBEC DIVISION

QUEBEC—SCM, Stan Comach, VE2EE—The old call EX is on the air again under new management. BP passed his Commercial and has been entertaining GM of old Quebec. FO has invested in an R.M.E. receiver. AI moved from Hampstead to Mt. Royal Gardens and HK has a new neighbour. VE3CA was recent visitor to the Metropolis. A few XYL's have been inquiring whether Bill's call is VE9DR. No, ladies, Bill uses high power. DG is moving out near his old location; must be the call of HT's cellar. CR had last contact with a VK before dropping the old skywire. GO was presented with a Bonnie YL at 3 a.m. recently, promptly went home and contacted a G to relay the glad tidings to his folks across the pond. Trunk Line suffered temporary disruption of schedules through absence of regular operator and illness of DR but business as usual now. IE has joined the Benedicts. HY is putting out a nice signal on 14 mc. One of the W1 gang told the S.C.M. that the only VE2 he hears is BE. GA has strung another skywire. The DX Tests over, AX will hibernate for another year. JK QRT radio until after exams. BU completed his second year of schedules with VE3WK and W1GKM, missing not more than six days throughout! DR has pushed his total of countries up to 61. DU, AH, HP and EE motored down to the Bridgeport (Conn.) Convention. Our representation at the Boston show was DU, HP, JK, BK and EE. FG strung up a new antenna with what he calls a J termination! LC has left us for a while to take unto himself an XYL. HM has moved to new QRA. BO is at present recuperating in the hospital after an operation. We hope you will read this fully recovered. Geoff, X-2BO is with us again under the call CG. CX, GA and BG are all interested in 56 mc. W3COT is in Montreal with R.C.A.-Victor. Welcome, Bob. LJ has invested in an 802 to kick the tens a little harder. LV seems to have no trouble at all working Cuba. GT is getting out well on 'phone. EP has gone down to Halifax. LQ was in Montreal recently; expects to go to Labrador. IJ is operating 'phone on 14 mc. The Canadian Second District extends greetings to those fellows who were with us at the Eastern Division Convention. We were very pleased to have you with us and trust that you enjoyed your stay.

Traffic: VE2DR 112 EC 37 DG 180 GO 4 BU 39 JK 55 BK 4.

VANALTA DIVISION

ALBERTA—SCM, Alfred D. Kettenbach, VE4LX—The committee in charge of the big Calgary hamfest July 4th and 5th have everything well organized and promise a very instructive and enjoyable time. CY worked his EA. LA is now on 28 mc. DV is new 'phone ham. BZ is on trip East and AF, EO and MS will hold down the trunk line during his absence. GE and QK are going strong on their schedule; have maintained it for over one and one half years. HM has new 50-T working FB. BW sold rig and has already built new receiver. GT returned from the north and resumed second op duty at EA. QX is building new super using metal tubes. AH is in Hallicrafters contest. UY worked all W's, South America and Australia on 28 mc. with 20 watts input. EO has 3.9-mc. 'phone perking using '03A in final. OZ is on 7-mc. c.w. NG is DX hunting on 14 mc. VN is on 14 mc. with '46 final. AJ is on 7 mc. with P.P. tens. Lethbridge gang reports 56 mc. FB at its field day.

Traffic: VE4BZ 84 LX 57 QK 11 GE 7 EO 6.

BRITISH COLUMBIA—SCM, D. R. Vaughan-Smith, VE5EP—HC has settled down to traffic routine at Taylor Windfall Mines under Comm. call but manages to get on the ham bands once in a while to do a little hamming; he keeps in touch with Vancouver through JP. EU has also gone commercial. With these two removed EN and KB now manage to snaffle the odd DX. EO, BI, JC and IC were B.C. big shots in the DX contest. The B.C.A.R.A. station, 9AJ, manned by FI, CG, GX, NG and EP sweated to get half a dozen contacts! New clubs were formed in North Vancouver and New Westminster and both promise well. JK, EO, KC and BE all had a crack at 28 mc. with FB results. IQ on 28-mc. 'phone, 15 watts, worked a J. OT on 14-mc. 'phone works just about everywhere. OM expects to make a hole in 7 mc. with new 100-watt rig. AM is going great guns on 3.9 and 14-mc. 'phone. KT is heard often with a potent sock. BK covers B.C. nightly with a "skad of skeds"! ER proves his transmitter an asset to Wingdam, his present QRA. CC gets improved results with a few changes in rig and frequency. Okanagan Club had a very successful social with big attendance from the valley gang. Victoria club hopes to have a new club house ere many moons, as present from one of the gang! Alberni gang report increase in membership. DD now handles T.L. "F" and does FB job while FM pinch hits on T.L. "I" in AV's absence. Cecil Sawyer is plenty busy with appointment as Convention Manager for the Vanalta Convention to be held end of August. The S.C.M. is going gunning for more reports, both activities and traffic! 73.

Traffic: VE5HC 29 DD 19 JP 13 OK 2 CC 12 FM 19 EN-EP 7.

PRAIRIE DIVISION

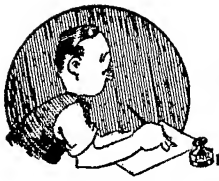
MANITOBA—SCM, A. J. R. Simpson, VE4BG—The Trunk Line key station AG turns in a good total. VG in an emergency on Good Friday gave a detailed weather report to ex-5GO, airways operator at Ilford who needed a good report on the weather at Winnipeg before starting a plane off for Winnipeg. TV is operating for a lumber company at The Pas. SS is busy getting output on 14 mc. NI worked G5ML and VK2NO on 14-mc. 'phone. CG at Winnipegosis has FB 'phone rig and receiver all run by batteries and motor generator, which operates on 3.5 mc. when not operating commercial CZ5V. TJ can be heard exploring the mysteries of 14-mc. 'phone. RO keeps on working the DX. DU works the G's by 'phone. GC swapped his VO5OO for an RK20. GL gets results with his high power Class B and works 'phone DX. KU has that J card at last. GQ is on 14-mc. 'phone again. IP works his 'phone occasionally. MW has been copying commercials to get his speed up. QF has that RK 23 perking along okay at last. ZK will be going high power soon with a 150T final. VI works DX as usual. MY's shack is turning into a museum of dud tubes, burned out his T250 and few days later an MT4 followed suit. QY entertained the local gang and showed the boys what can be done with a rig with 59's exclusively. WK is heard putting out a strong c.w. sig on 14 mc. We wish to express the gang's heartfelt sympathy to Mr. and Mrs. Harry Eddy in their recent loss of the junior operator.

Traffic: VE4AG 120 NI 22 VG 33 SS 4.

SASKATCHEWAN—SCM, Wilfred Skaife, VE4EL—OC makes a '10 do FB work DX with only 100 watts input. ES has been under the weather but is OK once more. UZ works nice DX with 40 watts input. Ex-4JH is now 5EV and operator of VDG in Queen Charlotte Islands, B.C. 4XL is back in Regina. OR is still at Dundurn. XM tried 28-mc. 'phone but went back to 7-mc. c.w. ML is experimenting with a photoelectric cell. UQ is now c.c. UK has 'phone rig on 28 mc. WO has been in hospital. BD now has RK-23. MU is on 7 mc. CM has a rig that looks commercial. EB is on 1.75-mc. 'phone. YM is training sister as 2nd Op. It is reported that a bootlegger is using DB's call. FY is going to try 56 mc. again. UT changed QRA. SY is back on 14 mc. after a spell in hospital. JV worked Yukon to complete provinces. VQ is code hdqtrs. for budding hams. KA is using four '45's P.P.-Par. OM is QRL bug hunting. IG works Morse on 28 mc. LV is working good DX on 3.5 mc. ZC worked a K5 with a single '10. EP likes to gossip with VE4's on 3.5 mc. IV is now on 1.75-mc. 'phone, replacing JU, who is in hospital after emergency operation. YC might change QRA if floods get much higher. KJ does well on 7 mc. BD and EL make a few contacts with W's on 28 mc. UH is building c.c. rig with P.P. '10's in final. UD snared UE3EL for his first European. RJ is moving from 1.75 to 3.9 mc. QP is building super. MA has '52's on 14-mc. 'phone. IX attended S.A.R.C. meeting. UG is experimenting with sky-wires. JB had pleasant experience of 1200-volt transformer going up in smoke. QZ works a little DX between times. MB hooked ON for 21st country. PQ hooked XE on 7 mc. on first CQ after returning from East and feels good to be back among the boys.

Traffic: VE4CM 124 FW 16 UL 6 EL 7 KJ 2.

(*Continued on page 72*)



CORRESPONDENCE

The Publishers of QST assume no responsibility for statements made herein by correspondents

Stand By!

2035 West 111th St., Chicago, Ill.

Editor, *QST:*

At this writing, there exists, as you know, an emergency condition throughout the East occasioned by serious floods. Numerous cities and towns are entirely dependent upon amateur radio for communication with the outside world.

In emergencies such as this, it should be the duty of *every* operator to render all assistance possible, firstly by handling emergency traffic, and secondly, by remaining off the air until such time when the emergency has passed, or when no interference is caused to those stations actively engaged in handling emergency traffic.

On the evening of March 17th, various appeals were broadcast to have the channel from 3900 to 3910 kc. cleared for emergency communication from Johnstown, Pa., where W8FRC was doing a heroic job of attempting to relay information to and from his city. It seemed that every 'phone station in the east and west at once came on the air asking for information, and causing much QRM. Some of the operators of these stations became most indignant when asked to QRT, and as a result several verbal battles were waged on this channel, which, of course, added to the confusion. Any one of these stations could have gotten all the information desired by listening to W8FRC, W8DBC, etc., without putting their carrier on the air.

I would suggest that in future emergencies, the station at the scene of the disaster become the control station, and that *all* other stations *remain silent* unless called; much in the same manner as distress traffic is handled at sea. I think that it would be well to have such regulations adopted by the Federal Communications Commission as safety of life ashore is certainly just as important as at sea.

The present emergency, or rather the handling of the communications end of it, has certainly put a big feather in the cap of we amateurs; the selfish part of the organization notwithstanding. It is up to all of us to realize that such service justifies, all the more, our existence.

More power to W8FRC and his assistants, and *equal* praise to those operators who "stood by," realizing their responsibility in this emergency.

—*E. A. Roberts, W9VDQ*

QRR Channel?

4126–73rd St., Jackson Heights, N. Y.

Editor, *QST:*

I have just had an idea (whether it is original or not, I don't know) that a certain portion of the 3500 to 4000-kc. band should be set aside for emergency communication. Say about 20 kc. from 3890 to 3910 kc., 10 kc. for c.w. and 10 kc. for 'phone, to be used solely for emergency traffic. Amateurs desiring to render a really worthwhile service to those in distress would occasionally tune over to that portion of the band to listen for any QRR traffic. Those hams having crystal-controlled transmitters should keep crystals of that frequency on hand, especially the ones living in the flood and hurricane districts. Wonder what the rest of the ham fraternity think of this idea?

—*Morton Slavin, W2IZX*

"Ogglewobble"

4205 Chester Ave., Philadelphia, Penna.

Editor, *QST:*

Isn't it about time some strenuous efforts were made to clean up the 1.7-mc. band? One cannot but be appalled by some of the drunken brawls and very questionable language encountered more than occasionally on this frequency.

To-night, for instance, I listened to one W3 who was obviously deep in the throes of a good "bender." For about an hour this fine example of the amateur spirit polluted the ether with vivid comparisons of the biological merits of various YL's of his acquaintance, interspersed with some good, old-fashioned cuss-words.

The situation has about the same aspect as that of the drunken driver. I'm sure that most of us take a drink or two now and then, or bandy an occasional strong word, but the amateur bands are distinctly not the place for such pastimes. This is even more true in view of the ever-increasing number of all-wave receivers, and the presence of more than a few YL operators in our midst. The impression conveyed is, to say the least, a very poor one.

I think that, beside having a group of Cairo Observers for more frequencies, we might also have a society for better conduct to avoid losing what frequencies we do have.

I am working on a little device to be known as the "Ogglewobble" for the benefit of the decadent

gentry who pollute our airways. It will be a device for neatly and expeditiously skewering out the tongue, and derives its name from the fact that "Ogglewobble" will be the closest they can come to calling "CQ" after the operation.

—*J. L. Evans, Jr., W2BBK/3*

Curing Telephone QRM

5415 Giddings St., Chicago, Ill.

Editor, *QST:*

Having been employed by the Illinois Bell Telephone for the past ten years, I have had contacts with numerous cases of amateur radiotelephone interference on telephone lines. In the majority of cases the operator of the offending station did not know what to do and felt that he was in for trouble. Other operators have tried in various ways at their own expense to eliminate this trouble. Being hesitant about tampering with telephone circuits, some stayed off of the air during telephone hours. The following information I hope will clear up all difficulties in this matter.

All telephone companies operating under the American Telephone and Telegraph Company are governed by rules which will aid amateur radio operators in this way:

Any amateur radiotelephone operator whose carrier interferes with telephone conversation in the neighborhood should call the local "Repair Service," state to them what telephone number his station is interfering with, his station call letters, name, address and how the operator can be reached for a test.

The transmission department of the local telephone company, if an A. T. & T. company, will install on the affected telephone either a by-pass condenser or a choke or both if necessary. This is done free of charge to any one. The radiotelephone operator may be called upon for a short test to make sure all is OK.

I hope that this article may be of some service to our brother operators, and to further better relations between us and the A. T. & T., not to mention the public.

—*George P. Pabst, W9NYR*

Tipping Off Frequencies

2804 Hillsboro St., Raleigh, N. C.

Editor, *QST:*

Recently I read (in your "I.A.R.U. News," I think) where some ham gave the frequency of the rare ones at the end of the QSO so that any one hearing could find the same station. I thought it a swell idea, so to-night I ended a QSO with ES5—with "ES5—14,300 kc. de W4EG." He came back and said he could not give my frequency, so I tried to explain what I meant. After the QSO, I heard him "CQ ES5—14,300". Evidently I got him all mixed up. I was terribly sorry, but had to laugh just the same.

The purpose of this letter is to ask if it is possible for you to explain the idea in *QST* again to avoid others getting mixed up on its meaning. It's a swell idea, but should be used only on rare stations. It would be foolish to give a W frequency when anyone in the world should have no trouble hearing plenty of W stations.

—*N. M. Patterson, W4EG*

Privileged Few?

1801 Sharon St., Indianapolis, Ind.

Editor, *QST:*

The attitude of VE3GG's letter in the March issue is certainly not the true amateur spirit. I don't believe A.R.R.L. ever has or ever will intend for amateur radio to belong to a privileged few who are on "the in." It's not right and it isn't true fellowship. I know that some of our bands are crowded, that is unfortunate. Maybe we can get more frequencies—and I'm hoping with the rest—but it still can be said that there is plenty of room left on ten meters that isn't being used. There is and was a beginning in everything. Ham radio is no exception. Nobody owns it; every amateur at some time or another has been and must be, a beginner. Some fellows forget this fact; others don't. A.R.R.L. believes in it. The doubtful should read the "Amateur's Code" in the front of the *Handbook*. There is only one right way to go about overcoming the overcrowded condition and that is to make the fullest use of the frequencies now available and apply with every effort for additional space. A selfish and overbearing method of elimination is surely not the proper procedure.

—*George E. Ross, W9TPI*

Hams and Peace

150 Puritan Ave., Highland Park, Mich.

Editor, *QST:*

. . . I would like the following remarks to be seriously considered not only by hams but by all who indulge in the sacred art of communication via the ether waves—commercials as well as hams.

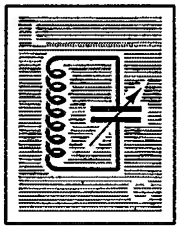
We being of a special type who have been granted the power and the conception to communicate and to make communications equipment whether it be for pay or for pleasure, have a special duty that we should perform and that no other mortal can. This particular duty should be foremost in our minds at all times. I am not one who likes to preach nor one who likes to listen to a sermon but I have a little lecture I would like to put forth to all ye who are in the radio field.

Have any of you by chance been readin' the papers? What is the foremost news? War, of course. Does this not mean anything to you? Are you who are given the power of communication so dumb that you can not see what war means? Does it not come to you that we cannot really be *nationally* inclined or minded? Doesn't the fact that we W.A.C. mean that we have brothers, no matter what race, color or religion, throughout the world? Shouldn't it be our sacred and solemn duty to help preserve the peace of mankind? We have no real place in any purely national set-up but we must adhere to international policy. Just because certain rulers whistle, should we go out and cut each other's throat? I am afraid that some of you would almost do that, forgetting the power of communication that has been given you; this point I gather from reading newspapers, journals, magazines and publications. Can't we forget our own troubles and petty jealousies and bring pressure on those who would like to throw everything into a chaotic mess called war? Without communication there couldn't be much war. Many of you would call me a pacifist—I am not, but I can't see giving up our sacred power to help a few childish so-called statesmen who get insulted and have their feelings hurt because someone has wronged them terribly by slapping them on the wrist. Here we really hold in our power a chance to help civilization and as far as I can see we are doing nothing. . . .

Wouldn't you hate to enter another ham's house and destroy his equipment and eliminate him from this earth when he never did anything to you? . . . Let's all do our best to keep our inferiors from slapping each other all over the map and prohibiting us from pursuing our natural course of life.

May I suggest one way to proceed (this is a very slow way)? Each one of us can attempt to interest three people in communication each year. Introduce those of the laity over the air to others at another station. Try and pick a station in another country if possible, or even across town will do some good and open someone's eyes. Let's make this international. Friends will never fight—argue, yes, but never fight. . . . I would like to see some editorials on such a subject. It should give all of us something to think about. We truly take our art too lightly. . . . I remember a great deal of discussion that Clyde Darr, W8ZZ, and I used to have about this same subject when he was alive. It was always his contention that a time would come that the ham

(*Continued on page 54*)



UNFORTUNATELY, an oscillatory circuit is quite complicated mathematically. Radio textbooks explain such calculations in detail, but amateurs can hardly be blamed for resorting to "rule-of-thumb." After all, amateur radio is a hobby, not a course of mathematics.

As a matter of fact, "rule-of-thumb" does very well when it is guided by experience and followed by skilful adjustment. Judging from the letters we receive, however, there is no general agreement as to the best type of circuit or the proper $\frac{L}{C}$ ratio. We do not wish to become involved in highly technical discussions or mathematics on this page, but we are going to try to clear up some of the confusion regarding the proper $\frac{L}{C}$ ratio in final amplifier plate tank circuits.

We are on safe ground in saying that the impedance of the plate circuit should be high, since this permits the tube to operate at highest efficiency. This impedance equals $\frac{L}{RC}$ approximately. Therefore, for any given coil efficiency ("Q"), we may conclude that the impedance increases as L increases, and that the tank circuit having the lowest capacity has the highest efficiency.

The above statements apply particularly to unloaded circuits. When the circuit is loaded, another consideration enters, namely storage capacity (or flywheel effect, if you prefer). To make this clear, suppose a single tube, Class C, is driving a loaded parallel resonant circuit. Once each cycle, the tube will supply a short pulse of power to the oscillating circuit. The circuit, however, must supply power steadily to the load, throughout the entire cycle. Obviously then, the storage capacity must be large compared to the peak input per cycle, or poor waveform and unsatisfactory operation will result. As the tube bias is decreased, the driving impulses will become of longer duration and less storage is needed. When grid bias is decreased to Class B conditions, the input power will be supplied over an entire half cycle, and the $\frac{L}{C}$ ratio may be safely doubled as compared to Class C. Going one step further, push-pull Class A or B gives power over the entire cycle, and the $\frac{L}{C}$ ratio may be increased to perhaps eight times the Class C value.

Other things being equal, the power output is proportional to the plate current. Therefore if the plate current is doubled, the energy storage should be doubled, which means that the $\frac{L}{C}$ ratio should be ¼ as high. (Double capacity, one half inductance). Similarly, double plate voltage also requires double the energy storage. But since doubling the plate voltage doubles the oscillatory voltage, the storage capacity is automatically increased four times. Therefore doubling plate voltage permits using an $\frac{L}{C}$ ratio four times as high. (Double inductance, one half capacity).

It is a simple matter to summarize the foregoing principles, combining them in a formula which is based upon past experience

$$\frac{\text{I: } \frac{\text{ma}}{\text{volts}}}{\text{E} \quad \text{x Freq.}} \times \text{K} = \text{Tank Condenser Capacity (mmf.)}$$

"K" will depend upon the type of transmitter, as follows:

Single ended c.w.	K = 2600
Single ended Phone	K = 5200
Push-Pull c.w.	K = 650
Push-Pull Phone	K = 1300

While we do not claim any great accuracy for this formula, we believe the information it gives will help the amateur in building a new transmitter, or in obtaining better performance from his present rig.

JAMES MILLEN

Correspondence Dept.

(*Continued from page 52*)

would be the one to hold the peace of the world. I believe it has.

—*Fred V. Collins, W8QN*

Short-Wave Anaesthesia

Healy's Point, Norway House P. O., Manitoba, Canada
Editor, *QST:*

. . . The Macuxy tribe in British Guiana claim to have a root which produces unconsciousness, or short-wave anaesthesia. I have met one of them who claimed the reception of messages while in this condition, and I must say it looked convincing if there was no fraud. I could detect none. I am confidently looking forward to great strides in this direction. Look at the value of such an anaesthetic during wartime when radio probably will be the handiest thing available, not to mention lowering the death rate by discarding ether, chloroform and their dopey family. Then we may even be able to direct waves of this at our irresponsible members of parliament, and after rendering them unconscious get our own back by alleging laziness when we wake them as the session finishes. We may even be able to tone up other people's wavelengths when they are in a disagreeable mood. Look how useful this would be when that irate individual calls for the overdue installment on the piano. Coming back to the war question again, just imagine giving that sort of an anaesthetic to the opposing army and when everyone was asleep cutting their trousers suspenders like Charlie Chaplin used to do. What a victory—absolutely bloodless! You could even keep your mother-in-law under the influence all the time she stays with you by just concealing the apparatus. I tell you, we are only beginning to appreciate the valuable possibilities of this our latest addition to electricity.

One last suggestion: There is a certain American who calls himself an explorer and who writes and has written all sorts of "tripe" about his experiences in the *unexplored* parts of British Guiana while on an amateurish holiday of a few months duration thereabouts. I spent just nine years in this country, in the interior amongst the Macuxys, the Uapixanas, the Aturaius, the Akawias, the Caribs, the Arawaks, and goodness knows how many more, and I'd like to tell the aforesaid gentleman that when he says the Macuxy tribe have the secret of tempering copper he is a confounded liar. They have aluminum or bauxite, in abundance. They have carbon, from the diamond to graphite or plumbago. They have antimony, manganese, tin, gold, platinum, osmiridium, beryllium, jaspar, garnet, tourmaline, mica, kaolin—but he could eat all the copper the place has without interfering with his digestion. Fellows like these give Americans a bad name. *En passant*, we have plenty of them ourselves, so perhaps we shouldn't grouse. I started to tell you about this explorer before I went "off the deep end" with the object of an application of a lethal dose for people like him. If ever you meet this gentleman you might read him this letter and tell him I am perfectly willing to sit on the red-hot points of all the tempered copper he gets from there, or anywhere in British Guiana or Brazil. . . .

—*Edward Healy*

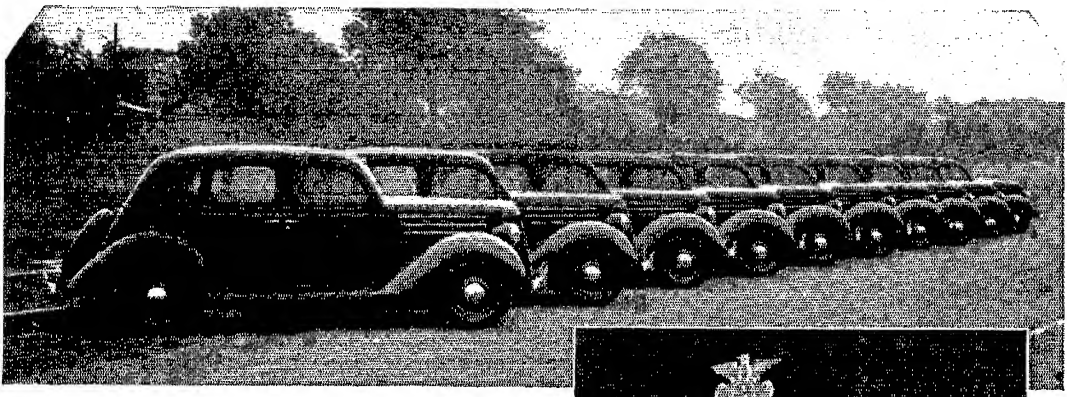
RAC Notes

Co. 1502, CCC, Stearns, Ky.
Editor, *QST:*

This letter is prompted by several which have appeared in *QST* lately on the subject of r.a.c. notes, the latest by W6LHW in the April issue. The undersigned has been off the air for nearly a year but has kept up with ham radio fairly well by means of *QST* and occasional listening, and now that we contemplate a return to ham activities we have been listening quite a lot. I can absolutely confirm W6LHW's finding that most of the offenders are old timers! And about half of the r.a.c. notes appear to be intentional, the other half carelessness. The same thing is true of frequency-modulated and overmodulated 'phones, which are in the same class.

It is obvious that there is no place on the air for these stations; they are not hams but hogs, *and it is directly up*

TAKE A TIP *from* FORT WORTH!



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HENRY B. LEWIS, Chief of Police
Fort Worth, Texas

Like Chief Lewis, police chiefs in all sections of the country depend upon Delco-Remy Special Service Generators for adequate current output to meet radio and other electrical requirements. Amateur radio operators have also found that the same generators on their own cars provide for the extra current requirements of two-way radio and other equipment, in both low-speed and high-speed driving.

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to the rest of us to see that they don't stay on the air! For one thing, they are directly violating the law!

Previous correspondents on this subject have not done much in the way of suggesting cures. It is the purpose of this letter to point out two ways to drive these birds off the air and to ask if we hams have the intestinal fortitude and the initiative to employ them.

One very effective way is to turn them in to the R. I., with sufficient proof, of course, to tie the can on them. This can best be handled by local clubs, possibly by means of a grievance committee. I would suggest that each offender be given three warnings, and the third time be turned in. The grievance committee should, of course, be authorized by the membership to use a certain amount of judgment in determining whether the offense was intentional or not, and if not further consideration might be merited. But whether you, as a ham, realize it or not, it is true that *any person who hears one of these illegal signals and fails to turn him in can have his own license suspended or revoked.* In other words, it is our duty to turn them in! Do we have the (in plain language) "guts" and enough of the coöperative spirit to do this? We haven't had to date.

Another very effective and less drastic way to clean up these notes would be by means of a blacklist. Let everyone who hears this kind of signal report it and let the list be *published* periodically. It is safe to say that the hams (?) thus held up to scorn would not offend again. And possibly some of them would clean up before they were caught. And it would be helpful to the O.O.'s to have such a list published so as to determine just what stations were chronic offenders. And then let us all agree not, under any circumstances, to QSO a station on the blacklist for a period of three months or so.

I have set out above two methods of cleaning up the air which appear to be workable. Do we have the courage and the interest to try them? This is a challenge to the A.R.R.L.

—*R. B. Jeffrey, W8GDC*

1057 Elm Rd., N.E., Warren, Ohio

Editor, *QST:*

In reference to the so-called super r.a.c. notes that W6LHW writes of in April *QST*, page 76, I must say I cannot agree with him.

I do a lot of listening on the ham bands and the only r.a.c. notes I hear come from a few foreign stations and very few at that.

I think it's about time W6LHW learns to distinguish the difference between a r.a.c. note and a *resonant filter* note. There *is* a whale of a difference between the two and I, for one, suggest that W6LHW learn the difference before doing any more writing.

The QRI's that emit from the W6 hams are, in my opinion, the most beautiful distinctive and piercing notes on the air and I cannot agree with W6LHW when he says "I believe that such a condition is interfering with amateur communication." A resonant QRI is a wonderful improvement over a p.d.c. crystal QRI and causes *less* interference between stations and that's the reason, no doubt, W6LHW says "personally these notes don't hurt me by interfering."

A resonant QRI, due to its particular audible characteristics, possesses a greater carrying range than a p.d.c. crystal QRI and is more easily copied at DX points and through QRM. . . .

—*J. R. Magee, W8CNC*

EDITOR'S NOTE.—W8CNC neglects to mention that the F.C.C. regulations state, "382. Licensees of amateur stations using frequencies below 30,000 kilocycles, shall use adequately-filtered direct-current power supply for the transmitting equipment, to minimize frequency modulation and to prevent the emission of broad signals." Frequency modulation, whatever the cause, is illegal.

Not New, But Still Bad

76 Goff St., Auburn, Maine

Editor, *QST:*

I am writing in regard to bootlegging calls—the old complaint to you, no doubt, but a new experience for me. Hi!

Imagine my embarrassment when, after trying for some time to hook a new station in Ohio, brother ham comes back with, "Sure gld to cu agn, OM." I grab wildly for my log and thumb it through for proof of previous contact, trying to copy at the same time. Sum fun, eh wot? Then, too, the

mailman is getting round-shouldered, bringing QSL's that I can't very well answer as I have never worked them. I do wish to thank friend (?!) bootlegger for using xtal control, as it shows that he has some consideration for me at least. Perhaps he thinks that my puny thirty or forty contacts a week are not enough or maybe he is anxious about the other half of my shack which is not papered with QSL's.

To those who have sent QSL cards and received none, I would like to have them know that I do answer all whom I have worked.

—*"Doc" Marston, W1IJX*

Stamps

410–12th St. B. North
Lethbridge, Alberta, Canada

Editor, *QST:*

In reply to the letter by VE3HT in November *QST*, I would like to say that I am a stamp collector and have thought of doing the same thing—putting a letter in *QST*—but he beat me to it. Hi! Now he has broken the ice, I think I can give him, and probably others, the calls of some stamp collectors that I happen to know about. They are EA3EG, SP1DU, F8GG, W5ASX and W5IA. Some of this information was received by me from an Australian SWL, Mr. E. R. Sebire Victoria, who is also a collector.

I hope this may be of some value to the hams who collect stamps. I might say also that I would like to trade Canadian Jubilee's for British Colonials or Spanish stamps.

—*W. R. Savage, VE4EO*

'Phone Band Sub-Division

1521 N. Temple Ave., Indianapolis, Ind.

Editor, *QST:*

This letter is not written to satisfy an urge to gripe or to suggest a new way for the amateurs to cut each other's throats, as the case may seem, but rather to offer a suggestion which would enable the medium and low-power 'phone men to get more benefit from their equipment.

While widening the band would help materially, the chances are that any channel chosen by a low-power man will also be occupied by a high-power man a large part of the time. My suggestion is simply that a portion of each 'phone band, or at least the 3.9-mc. and 14-mc. bands, be turned over to the medium and low-powered men exclusively. This would make the high-powered stations fight it out among themselves, giving the low-powered men a chance to compete with similar stations.

Since most of the 'phone stations are of the medium and low-powered variety, surely they would be entitled to half of the two popular 'phone bands, namely, under the present set-up, 50 kc. around 14,200 kc. and 50 kc. around 3900 kc.

It is my opinion that such low-power stations should include those with 50 watts or less carrier power, or better still, those whose peak power on modulation does not exceed 200 watts, thus putting the high-power voice-controlled-carrier stations in their proper place.

I have nothing at all against the high-power men, but should there not also be a spot in the spectrum where the low-power 'phone man can operate without having to wait until the 1-kw. stations shut down?

No doubt many hams will feel that there are enough restrictions already, but it seems to me that such a system as suggested above would permit many more stations to operate at once, and at the same time stop the tendency for all 'phone men to try to use the maximum power.

What do other 'phone men think about it?

—*Curtis S. Springer, W9EMR*

Weather Reporting Net

The Army Meteorological Office at Fort Sam Houston, Texas (W5OW), for about a year and a half has received a daily weather reporting service from members of the 8th Corps Area A.A.R.S. Weather Reporting Net. Each operator is furnished a set of instructions telling how to identify ceiling, sky, visibility, weather, obstructions to vision, wind, etc. A daily morning report is made up, in message form, by each net station and sent to W5OW at Fort Sam Houston. Stations in the net include W5RA, W5BEF, W5CMJ,

. . . keep this page for reference . . . it will not appear again.

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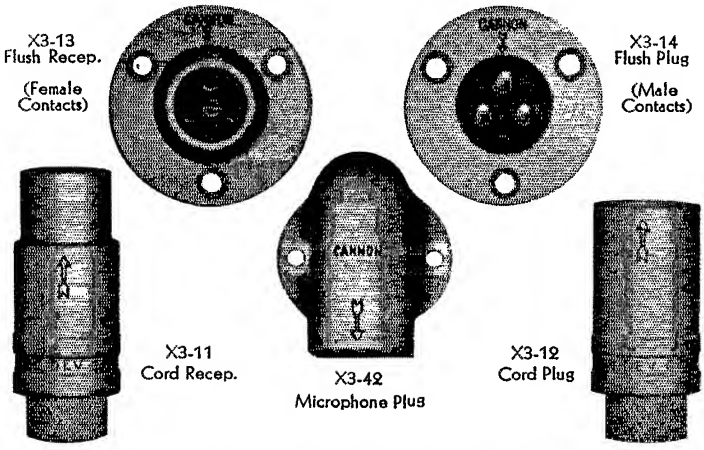

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A severe sleet storm struck Central Maryland during the night of February 13th. The morning of the 14th found many telephone and telegraph lines down. The main lines between Westminster and Baltimore were out. W3CDG (A.A.R.S.), Westminster, offered the services of his station. Western Union filed a message for Baltimore. After a few QRR calls, W3CDG raised W3GBG in Baltimore, who took the W.U. traffic. W3ELK (A.A.R.S.), Baltimore, broke in and offered to help. A schedule was arranged between W3BRS on 1.75-mc. 'phone and W3ELK, who shifted from 3.5-mc. c.w. to 1.75-mc. 'phone. These stations kept regular schedules during the afternoon to QSP traffic for the telephone company. W3CDG QRT at 11:30 a.m. when W.U. reported their lines OK. QRN at night forced W3ELK to switch back to 3.5-mc. c.w. and W3CDG was called back, making a three-way schedule with W3BRS on 1.75-mc. 'phone and W3CDG and W3ELK on 3840-kc. c.w. This schedule was kept at frequent periods until noon of February 15th, when telephone lines were back to normal.

CALLS HEARD

OK2HX, Emil Zavadil, S1. Ostrava, Czechoslovakia

(3.5-mc. band)

w1bkl w1hsi w2foa w2jer w3awu w3bkt w3bwt w3exa w8bas w8uv w9ell

(7-mc. band)

w1czo w1dsf w1dto w1gmr w1hiu w2bjc w2clc w2csv w2dew w2dsa w2dtb w2dyt w2fpl w2fpx w2gux w2kl w3awl w3bgn w3bsb w3bsd w3csj w3dwp w3eju w3ekn w3lug w3rbc w4bns w4cgw w5cuj w8bti w8hcl w9aes w9elx cx1bu k4aj k4rj k5aa lu2eg lu4dc lu5bl lu7ax lu1ab lu1ad vk1fn vk2en vk2rx vk3pg vk3zw vk5am vk5at zl1dj zl1hd zl2bp zl2bz zl2dj zl2fn zl2gy zl2kk zl2lb zl2mm zl2mo zl2mr zl2oq zl2ow zl2pc zl2qm zl2qt zl3az zl3bl zl3fr zl3gn zl3jd zl4fo zu6b

(14-mc. band)

w1axa w1aqx w1bxc w1bwa w1caa w1clx w1dgc w1dhe w1dya w1dze w1fet w1fax w1hem w1hqk w1hou w1lh w1lz w1sz w1ts w1wv w2aol w2acd w2abs w2arb w2byp w2bem w2coq w2cyn w2cuq w2ccs w2csv w2dng w2dtb w2dhc w2evi w2eyy w2far w2gdq w2gld w2gpv w2gvs w2gw w2hfn w2hmk w2hto w2ib w3ag w3daj w3djf w3dly w3edp w3fgb w3qm w4ajx w4dbc w4dhs w4htr w5adp w6cuh w6exq w6fzy w6gal w6grx w7dzl w7eil w8azd w8bkp w8bti w8cra w8dhc w8djw w8iwi w8kpb w9blu w9cgy w9fjr w9lb w9plm w9pst w9rkr zl1dv zl1mq zl2cw zl2gn zl2ho zl2mo zl2of zl2ow zl2tt zl2qm zl4fo vk2ap vk2eo vk2ep vk2fm vk2hp vk2qr vk3jt vk4et vk5md vk6uo vk7kv vk7kw ve1cd ve1dr ve1bv ve1ea ve2dr ve3er py1dj py2ac py2ae py2ah py2ba py5aa k5ac k5ag cx2ak vp3i vu2bl vu2dc lu5an k4kd zb1h zd8a zs1al zs1h fb8c su5nk ff8mq

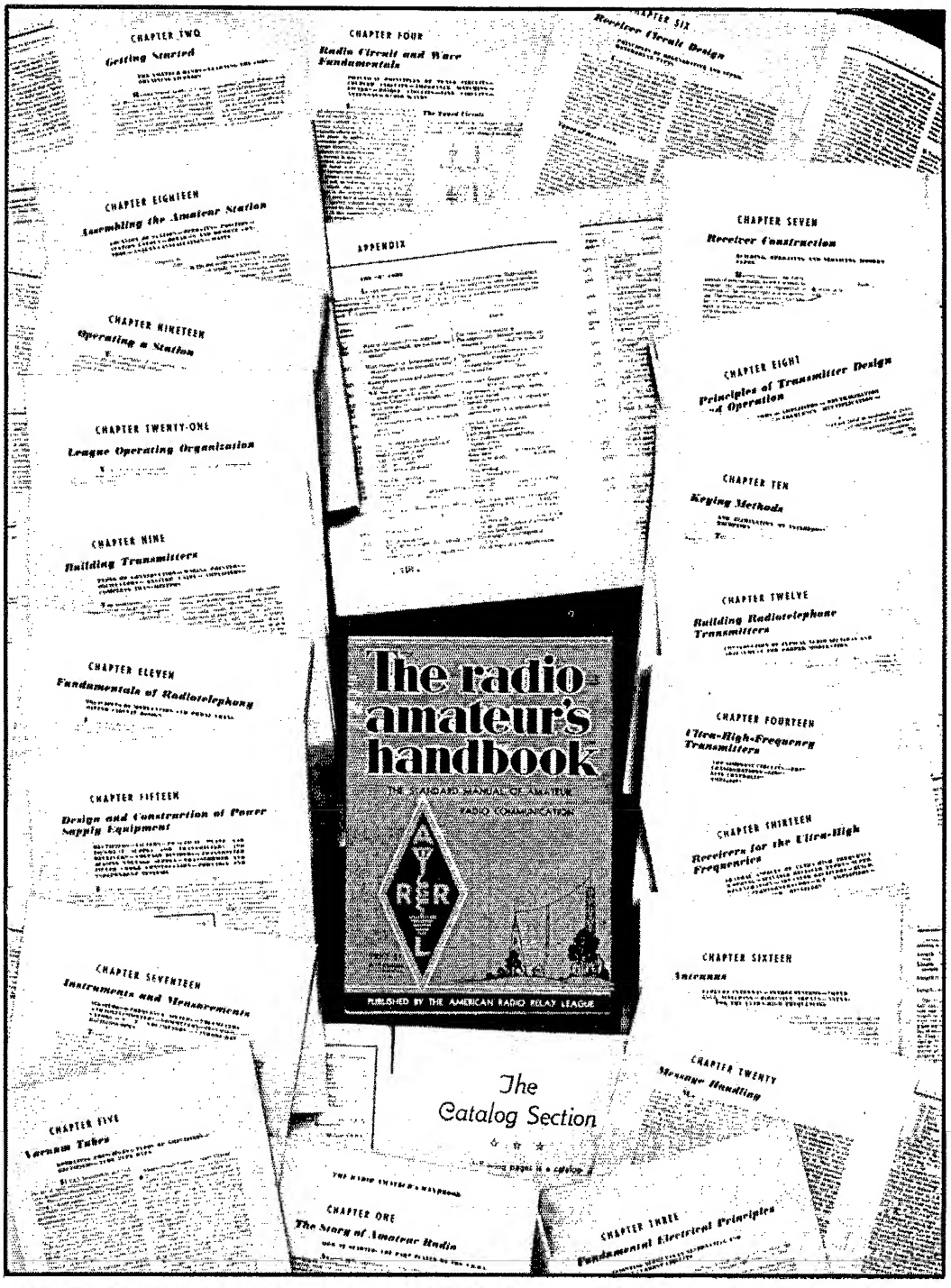
W9PTF, Jack Pinard, 1505 Flett Ave., Racine, Wisc.

(14-mc. c.w.)

ct1ju ct1cb cx2ak ea2ad ea3av ea3an ea4av ei4av ei8b f8fc f8wk f8hu f8ef f8rr f8um f8ai fb8c g2dv g2tm g2ds g2pn g2nm g2hx g2kx g2bk g2pl g5ch g5yh g5cq g5gm g5wt g5qa g5kt g5wi g5kg g5xa g5jo g5rv g6gf g6nj g6nb g6vp g6qn g6gs g6nq haf4h hb9aq hj1aa hp1a j2gx j2hj j2lu j5cc k4rj k4sc k5ac k5ag k5af k5aq k5ad k5am k6auq k6ddn k6bhl k6ltz k6bux k6ewq k6lkn k6ibw k6gqf k6kpd k6lhk k7bc ka1cm lu4bq lu7bh lu7ef oa4z ok1ln ok3id on4nc on4sv on4hc on4au on4gw on4rx on4dx oz3g oz7zl oz9wb pa0ti pa0xg pa0rn pa0ql pa0jv pa0un pa0sd pa0zk pf2db py1aw py1dj py1cr py2bx py4ad py5ag py9ah py9bc su1ro ti2tao ti2rc ti2ea ti3wd vk2fy vk2px vk2hp vk2ls vk2hl vk2ic vk2sx vk2eg vk2pw vk2el vk2eo vk2ap vk3jk vk3oc vk3mr vk3cx vk3gq vk3kx vk3yp vk3rj vk3kg vk3nw vk4rg vk4do vk4ka vk5fm vk5wk vk5su vk5jc vk5zy vk5zx vk6fo vk7bj vp1jr vp2am vp5ps x1aa x1ag x1am x1cz x1ay x1cc x1fy x1da x1r x1ba x2n ze1jr zl2ci zl2ja zl2bz zl3dj zl3id

(14-mc. 'phones)

g5ni hi7g hp1a lu6ap ti2rc ti3av vk2ep vk3oc vp6nw x1q x1g



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Buckram Bound, $2.50

American Radio Relay League, West Hartford, Conn.

Al Vasko, Swanton, Ohio

(14-mc. 'phones)

ea4ao f8gl g2nh g5ml g6xr on4ac on4au

(14-mc. c.w.)

j2hg j2hj j2lb j5cc

(7-mc. c.w.)

ka1cm om2rv om2ld vq6ak va7a

W2DTB, Wilson Scofield, 88 Smith Ave., White Plains, N. Y.

(14-mc. band)

vs6aq ka1cm ka1lb ka2es pk3bm pk3st vk2as vk2bw vk2eo vk2lb vk2qv vk2sq vk2th vk2uy vk2xu vk2zp vk2zw vk3bv vk3cp vk3dp vk3jk vk3kg vk3kx vk3mr vk3uj vk3vw vk3wo vk3yk vk3yp vk4bb vk4ka vk4mf vk4xb vk5fm vk5hw vk5ly vk5rt vk5wj vk5ws vk5yk sl2bn zl2lb zl4bq su1rk su1ro su5nk fb8c on4csl ze1jb ze1js j2cl j2cn j2hg j2kn j2lb j2lk j3de j5cc j5ce

G6YL, Miss B. Dunn, Felton, Northumberland, England

(14,000-kc. band)

w5ai w5bcu w5bee w5bmm w5cuj w5dvi w5ega w5ql w6adp w6amx w6awt w6bgc w6bgy w6bp w6byu w6byy w6cgq w6cis w6cug w6cuh w6cxw w6cyy w6dbb w6dtb w6exq w6fal w6fdq w6fyt w6fzl w6fzy w6grx w6gq w6gad w6hjw w6ira w6iox w6jjw w6lfl w6qd w6vb w7ait w7amx w7ayq w7bby w7bd w7bik w7bme w7bpj w7bub w7dl w7drj w7ejd w7qc w7vq w9aeh w9aof w9kgl w9nvo ce1ai ce2ar ce4ad cx1bg cx1bz cx1cc el9ab f3mtd fb8c j2cl j2kn j2lu j3fk j5ce k4sa (fone) k5aa k5ac k5ag k6esu lu1je lu3fc lu4dq lu5bc lu5fv lu5il lu6ap lu6dg lu6dj lu6djk lu6er lu6jb lu7ef lu8dj lu8en lu8xr (fone) lu9bv ox7esk on4cjj pk2aj pk2dx py1aw py1dj py1dm py1dw py1if py2ae py2bk py2bu py2bw py2bx py2co py2do py2dq py3aw py3cf py4aa py5ag py9ad tf5c ve2do ve3adm ve4bx ve4eg ve4gc ve4to ve4vi ve4wa ve5bi ve5gi ve5io ve5ks ve5nl ve5oa vk2eo vk2oc vk3mr vk5wk vp2at vp2bx vp2er vp4ta vp5ab vp5px vp6yb (fone) vq3msn vq4crl vq8a vs1aj vs6aq vu2db vu2dk vu2eb vu2jp vu2re xu1b xu3r yn4ab zd2c ze1jj ze1jr xbb9ak xoh3nq v6p wcuj xzn2b xzn2c g2mip g5fbp g5lap g6etp

(28,000-kc. band)

w1avv f3ad f3ar f8cnp f8ct f8ef f8ex f8gpj f8gq f8hs f8kk f8ky f8ox f8pk f8rq f8vi f8ten f8vo f8vs f8wk f8wq f8xs fa8bg fa8cr fa8ih fm8gt g2hg g2mv g2tm g2yl g5fv g5vb g6rh ei6l ei8b d2cu d4aau d4arr d4bar d4bbn d4bed d4box d4bdf d4bmj d4bwm d4caf d4cnf d4drc d4gdf d4gwf d4hcf d4ifh d4kpj d4ksj d4lnm d4ltn d4mdn d4oon hb9j hb9b i1it lu1ep lu6ak lu9bv oe1er oe1fh oe3wb oe6ok ok1aa ok1aw ok1cg ok1ff ok2ak ok2ma ok3va oh7nc on4au on4jb on4sd on4uf on4zy ym4dsh ym4zo pa0fx zb1i zt6k

W6JQC, Ed. Hintz, San Francisco, Calif.

(160-meter 'phones)

w1hmh w1huj w3akx w4dic w4cpg w4cys w4cwt w5eih w5aci w5dka w5eif w5fab w5dwp w5ewb w5duk w5czx w5cqc w8efq w8kkh w8byf w8fvw w8nzs w8ojt w8moy w8nk w8ges w8ibt w8iai w8mgb w9lou w9bpk w9ddf w9rgk w9unq w9tah w9sam w9dxi w9tlq w9pby w9thb w9bje w9pyp w9cju ve5ot ve5es ve5ky

VK3PG, N. M. Cameron, Casterton, Victoria, Australia

(14-mc. 'phones)

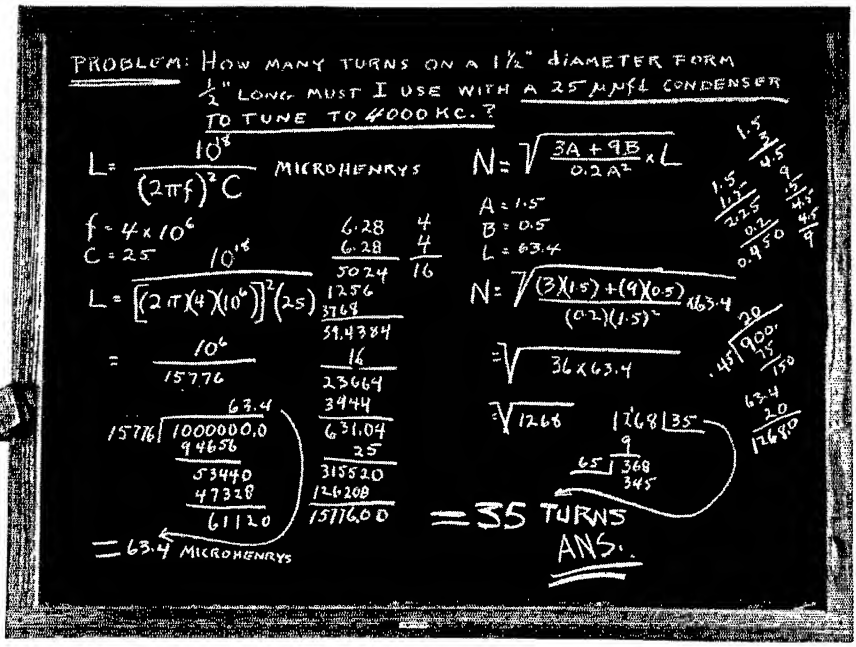
g6xq hb9j hc1fg j3dp w6zh w6cin x2ah

W6DRE, 80 W. Lewis Ave., Phoenix, Ariz.

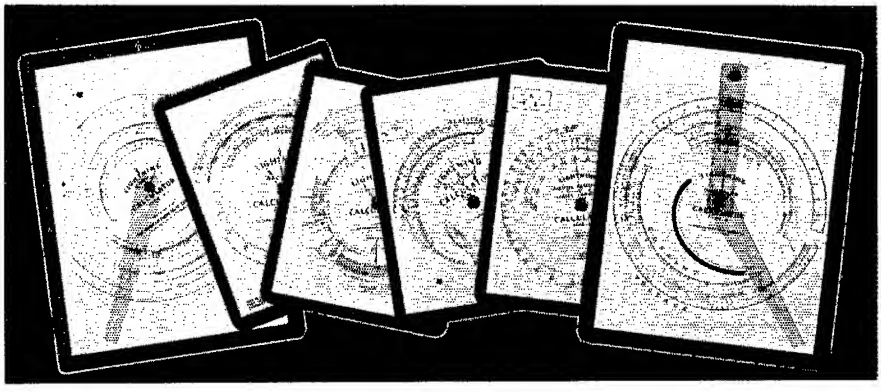
(14-mc. band. May–Sept.)

ct1js ct3ab d4bao d4dqm d4biu ea4av ea4ao ei5f f8fw f8gt f8pz f8tq f8eo f8gq f8lu f8lv f8vp fb8c g6ab f8mz g2by g6lk g5by g6qx g2bm g5ml g2pl g2bo g6nj g6oy g5bd g2nm g6cj g5bj g6rb g6uf g6ir g2la g6jb g5qy g2yy g5no g2in g6kx g2yb g6cl g6jq g5rx g5fn g5mp g6uf gi5ur hb9j hb9ak ly1j nx2s oe7ej oe1cp oe1fp oe3kh oh2hp oh3np ok2ak ok2rm ok1lm ok2ms ok1rq ok2km on4rn on4rx on4au on4uu on4fe on4ac on4cc ox7kr ox9wb pa0zz pa0xf pa0dc pa0zm pa0ll pa0zk pa0jmw pa0ql pa0ce pk1gw su1sg su1aq su1ro sm7yn u3vb u3cy u1cr a1ap u2ag u4ld u9dk u3aq u3qe u4le u2ne u3dm vs6aq xu8rl xu3fk xu8jf xu8lq

PROBLEMS



EASY



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TYPE A — For problems involving frequency, inductance and capacity, in design of radio frequency circuits. Direct reading answers for size of coils and condensers for any range between 400 kc. and 150 mc. Price, $1, postpaid.

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TYPE C — More information on electrical conductors than you could find in a book full of tables. Price, 50c, postpaid.

TYPE D — Gives decibel gain or loss when input and output voltages, currents or power are known. Price, 50c, postpaid.

TYPE E — Direct reading total resistance of resistors connected in parallel, and total capacity of condensers connected in series. Price, 50c, postpaid.

TYPE F — Permits measurement of resistance, from 1 ohm to 1 megohm by use of a voltmeter. Makes an ohm-meter of your voltmeter. Price, 50c, postpaid.

AMERICAN RADIO RELAY LEAGUE, INC., West Hartford, Conn.

Roger Legge, Jr., 20 Beethoven St., Binghamton, N. Y.

(14-mc. 'phones)

vk2ep k6cmc k6baz ok3id hb9j la1g ea4ao ct1by f8dr f8gr f8jj pa0idw pa0rp on4fe on4ac on4za cx2ak hjd2 hc1fg lu5cz lu6ap lu8dr py1ay py1ck py2ak py2ej py2ba py2bd py7bb vp2km vp3bg vp4tc vp5is vp6yb vp5ac vp6mo vp6nw vp6cs vp6tr vp9r hi2k hi7g hh5pa hh2w k4sa hp1a ti2av ti2fg ti2rc ti3av ti3wd vo1i wl0xfp g2ao g2dv g2ic g2ld g2oi g2tm g2xv g2in g5bj g5cv g5hb g5kg g5ml g5ni g5rv g5sa g5vl g5xa g5yy g6dh g6dl g6fs g6go g6jq g6py g6xq g6xr x1ai x1cs x1cz x1hh x1g x1k x1q x1w x2ah x2c co2an co2au co2fg co2hy co2jm co2kc co2ll co2ra co2se co2av co2ww co2wz co2xf co5ry co6om co7hf co8yb co8rq

Standard Frequency Transmissions

Date	*Schedule*	*Station*	*Date*	*Schedule*	*Station*
June 3	C	W9XAN	July 3	B	W9XAN
June 5	B	W9XAN		A	W6XK
	A	W6XK	July 8	BB	W9XAN
June 10	BB	W9XAN	July 10	BB	W6XK
June 12	BB	W6XK		A	W9XAN
	A	W9XAN	July 11	BX	W6XK
June 13	BX	W6XK	July 12	C	W6XK
June 14	C	W6XK	July 17	A	W6XK
June 19	A	W6XK	July 24	B	W9XAN
June 26	B	W9XAN		B	W6XK
	B	W6XK	July 29	C	W9XAN
July 1	C	W9XAN	July 31	B	W9XAN
				A	W6XK

STANDARD FREQUENCY SCHEDULES

Time (p.m.)	*Sched. and Freq. (kc.) A*	*B*	*Time (p.m.)*	*Sched. and Freq. (kc.) BB*	*C*
3:00	3500	7000	4:00	7000	14,000
3:08	3600	7100	4:08	7100	14,100
3:16	3700	7200	4:16	7200	14,200
3:24	3800	7300	4:24	7300	14,300
3:32	3900		4:32		14,400
3:40	4000				

Time (a.m.)	*Sched. & Freq. (kc.) BX*
6:00	7000
6:08	7100
6:16	7200
6:24	7300

The time specified in the schedules is *local standard time at the transmitting station.* W9XAN uses Central Standard Time, and W6XK, Pacific Standard Time.

TRANSMITTING PROCEDURE

The time allotted to each transmission is 8 minutes divided as follows:

2 minutes—QST QST QST de (station call letters).

3 minutes—Characteristic letter of station followed by call letters and statement of frequency. The characteristic letter of W9XAN is "O"; and that of W6XK is "M."

1 minute—Statement of frequency in kilocycles and announcement of next frequency.

2 minutes—Time allowed to change to next frequency.

W9XAN: Elgin Observatory, Elgin National Watch Company, Elgin, Ill., Frank D. Urie in charge.

W6XK: Don Lee Broadcasting System, Los Angeles, Calif., Harold Perry in charge.

Schedules for WWV

EACH Tuesday, Wednesday and Friday (except legal holidays), the National Bureau of Standards station WWV will transmit on three frequencies as follows: noon to 1:00 p.m. E.S.T., 15,000 kc.; 1:15 to 2:15 p.m., 10,000 kc.; 2:30 to 3:30 p.m., 5000 kc. On each Tuesday and Friday the emissions are continuous unmodulated waves (c.w.); and on each Wednesday they are modulated by an audio frequency. The audio frequency is in general 1000 cycles per second.

Strays

When *QST* readers write a *QST* contributor (who is not a member of the headquarters staff) to ask for further data on his article, won't they please enclose postage or an addressed envelope for their reply? It is a little thing, and the usual courtesy. It represents small expense to the sender, yet its omission increases the "national debt" for the author. One prominent *QST* contributor, praying us to urge the gang to send postage, says: "Seventeen letters and cards yesterday, asking for information on my last article, and 26 this morning. Please! I cannot afford it." Let's adopt it as a rule, when the other fellow is doing us a favor, to send postage for his reply.

Inexpensive panels may be made using Prestwood, Masonite building board or similar material. A good crackle finish may be applied by giving the panel one coat of clear Duco or Tri-Seal and allowing it to dry over night. Then spray on a coat of Kem Art Metal Finish, or lay it on thickly with a brush, taking care that the brush marks do not show. Allow this to dry a couple of hours and then bake in a household oven at 225 degrees for 1½ hours. This will produce a regular commercial job. This finish, which comes in several colors, may also be used on metal panels. Both types are produced by the Sherwin-Williams Paint Co. and should be obtainable through any of their dealers.

—*W8GVO*

Hints and Kinks

(*Continued from page 40*)

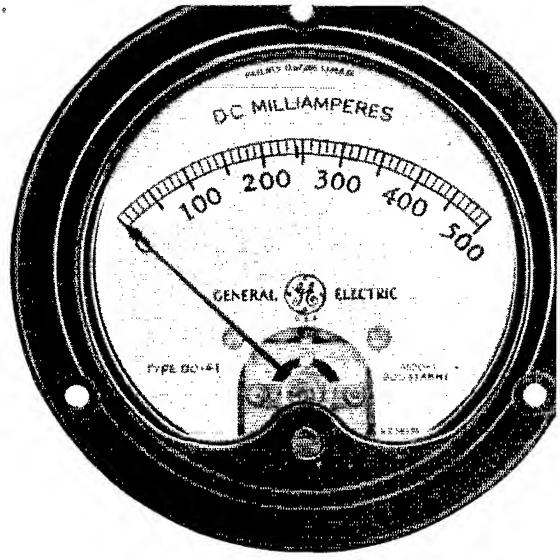
cabinet that houses the transmitter and practically wiped that out. Also wiped out the harmonics from R7 to 8 to a mere trace of a signal. So it does seem that a completely enclosed, shielded rig has its merits, if only from the standpoint of local QRM."

Southwestern Division Convention

THE baptism by fire of the year-old Southwestern Division of the A.R.R.L. occurred last April 4th and 5th, and the newcomer was found to be a fine, healthy, upstanding specimen. On that date was held the Third Arizona Hamfest, actually the First Annual Southwestern Division convention. The two-day program went off with the smoothness of greased lightning, and a goodly number of the 246 hams, servicemen, YL's and XYL's who lasted through to the banquet characterized it as the best-managed convention they had ever attended.

Events included a barbecue on SCM Day's magnificent "La Posta Quemada" ranch, a 5-meter hunt, theatre parties, "bull" sessions, dancing and entertainment, business meetings, stags, and a goodly number of speakers including O. L. Coulter of RCA; W. S. Farrell and Joe Reeside of G. E.; Lieut. J. E. Waters, U.S.N.R., and Lieut. Roy Jackson, U.S.N., W6JIP, who

IT PAYS
to Buy Quality



WHEN you build General Electric small panel instruments into your transmitter, you are buying a high-quality device that can be depended upon for extra-long life and sustained accuracy year in and year out. You are assured of a lightweight element, magnetic damping, and sturdy construction that are certain to give satisfaction.

There are G-E ammeters, voltmeters, milliammeters, and radio-frequency instruments for every transmitter need. See them at your dealer. Bulletin GEA-1239 on request. General Electric, Radio Dept., Schenectady, N. Y.

430-47

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PIEZO-ELECTRIC CRYSTALS

Guaranteed Accurate to BETTER than .01%

SCIENTIFIC RADIO SERVICE

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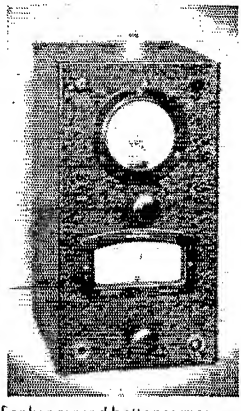


PRESENTING THE Haynes RIGCHECKER

An all-purpose instrument, for Hams, which will delight the heart of every "Old-Timer" and make the "Young Squirts" chirp with glee. Designed by A. J. HAYNES for his own use at W2JHV (ex-2 DY). Here are a few of its uses:

As FIELD STRENGTH METER; shows relative power *actually radiated*, permitting perfect adjustment of antenna length, transmission line coupling, rig efficiency, etc. The only satisfactory way to get the whole rig perking "on the nose."

As MONITOR; checks key clicks, line hum, voice quality, overmodulation or carrier frequency shift.

As FREQUENCY METER; may be calibrated for any or all bands from 5 to 160 meters.

As D.C. VOLTMETER, 0–10, 0–100, 0–1000 volts.

As VACUUM TUBE VOLTMETER for A.F. or R.F. with linear scale reading.

As TUNING METER — and signal strength indicator with receiver, also showing overmodulation of received signals, etc.

In short, as one old-timer put it: "It's the most useful gadget that ever cluttered up an operating table." It's the best radio investment you'll ever make. Descriptive circular and instruction sheet FREE on request. Order direct if your dealer cannot supply you.

For bigger and better carriers we give you the "HAYNES RIGCHECKER" Complete with self-contained tube, batteries, and seven plug-in coils for all bands..... **$17.90**

RADIO CONSTRUCTORS LABORATORIES

Dept. Q-1, 136 Liberty St., New York, N. Y., *Export Dept., 105 Hudson St., N. Y. C.*

flew from California; Robert La Rue, W6ALU, A.A.R.S.; W. W. Howe and Junius Fraps, of the Tucson Electric Light & Power Co.; and K. B. Warner, Secretary, A.R.R.L., via long distance telephone.

A great deal of credit goes to Convention Chairman Walter Ellis, W6CVW, and Convention Manager J. J. Bartlett, W6KMG, for the efficient management of the affair.

The convention was sponsored jointly by the Tucson Amateur's Club and the Tucson Servicemen's Association. How closely they were matched is evidenced by the baseball game, which ended a 58–58 tie. Next year it will be just a ham gathering, for all the servicemen are now going up for their tickets!

A.R.R.L. QSL Bureau

FOR the convenience of its members, the League maintains a QSL-card forwarding system which operates through volunteer "District QSL Managers" in each of the nine U. S. and five Canadian districts. In order to secure such foreign cards as may be received for you, send your district manager a standard No. 8 *stamped* envelope. If you have reason to expect a considerable number of cards, put on an extra stamp so that it has a total of six-cents postage. Your own name and address go in the customary place on the face, and *your station call should be printed prominently in the upper left-hand corner.*

W1—J. T. Steiger, W1BGY, 35 Call Street, Willimansett, Mass.
W2—H. W. Yahnel, W2SN, Lake Ave., Helmetta, N. J.
W3—R. E. Macomber, W3CZE, 418 10th St., N. W., Washington, D. C.
W4—B. W. Benning, W4CBY, 520 Whiteford Ave., Atlanta, Ga.
W5—E. H. Treadaway, W5DKR, 2749 Myrtle St., New Orleans, La.
W6—D. Cason Mast, W6KHV, 423 East E Street, Ontario, Calif.
W7—L. Q. Kelly, W7BPC, 4919 So. Prospect St., Tacoma, Wash.
W8—F. W. Allen, W8GER, 324 Richmond Ave., Dayton, Ohio.
W9—George Dammann, W9JO, 319 Sherman Ave., Evanston, Ill.
VE1—J. E. Roue, VE1FB, 84 Spring Garden Rd., Halifax, N. S.
VE2—W. H. Oke, VE2AH, 5184 Mountain Sights Ave., N. D. G., Montreal, P. Q.
VE3—Bert Knowles, VE3QB, Lanark, Ont.
VE4—Dr. J. J. Dobry, VE4DR, Killam, Alberta.
VE5—E. H. Cooper, VE5EC, 2024 Carnarvon St., Victoria, B. C.
K4—F. McCown, K4RJ, Family Court 7, Santurce, Puerto Rico.
K6—James F. Pa, K6LBH, 1416D Lunalilo St., Honolulu, T. H.
K7—Frank P. Barnes, K7DVF, Box 297, Wrangell, Alaska.
KA—George L. Rickard, KA1GF, P. O. Box 849, Manila, P. I.

BOOK REVIEW

Perpetual Trouble Shooter's Manual, Vol. VI, by John F. Rider. 1240 pages, including several double-spread schematics. Published by John F. Rider, 1440 Broadway, New York City. Price, $7.50.

The radio amateur's standing in his community almost inevitably causes him to receive a certain amount of b.c.l. service work. Of course, many amateurs are regularly engaged in professional service work. Both classes are doubtless already familiar with John F. Rider's unique aids to a knowledge of modern servicing, unquestionably the most useful and important of which are his series of "Perpetual Trouble Shooter's Manuals," in which are to be found schematic circuits, chassis layouts, voltage and current tables, and a variety of other specialized service information concerning almost every make and model of radio broadcast receiver ever manufactured. The new volume is an impressive addition to the series. Every variety of broadcast set appears to be shown, in addition to several strictly "communications-type" receivers. It is a wonderfully complete job.

—*C. B. D.*

Connecticut State Convention

THE 1936 Connecticut State Convention opened at 9 a.m. on April 4th with registration in the lobby of the Stratfield Hotel at Bridgeport. Early arrivals spent the morning in rag chewing and examining the fine equipment exhibit provided by manufacturers and dealers. The convention opened officially at 2 p.m. with an address of welcome by co-chairman Gilbert Williams, W1APA. Irving Strauss, RCA field engineer, followed with an interesting talk on the cathode-ray oscilloscope, demonstrating with an actual transmitter the many measurements that can be made. Some of the high scores in the DX Contest were given by Byron Goodman of A.R.R.L. headquarters, and an open discussion of DX conditions followed. James J. Lamb, technical editor of *QST*, was introduced and gave a comprehensive talk on recent developments in receivers. L. G. Burnell of U.T.C. told of transformer applications, and phone transmitters were discussed by G. W. Ray, W1ANN, and chief engineer of WICC.

The evening session opened with a real honest-to-goodness amateur "amateur hour" broadcast over WICC, conducted by Joe Lopez as master of ceremonies, and Phil Stern won with some excellent imitations of well-known entertainers. A liars' contest, a cracker eating and CQ contest, and a code speed (sending) contest conducted by the inimitable Ted McElroy were features of the evening meeting. A floor show, conducted by Joe Lopez through the courtesy of WICC, was followed by dancing until the early hours. At midnight, ambitious aspirants were initiated into the Royal Order of the Wouff Hong, to their immediate sorrow but subsequent pleasure.

Sunday morning saw mobile 56-mc. stations scouring the city in an effort to find the three hidden transmitters, and John Matthews,

(*Continued on page 74*)

STATION ACTIVITIES

(*Continued from page 50*)

HUDSON DIVISION

EASTERN NEW YORK—SCM, Robert E. Haight, W2LU—EGF continues holding the traffic crown. HYC is using a single '45 amp., 20 watts. LU sports new Chevy. FQG is stepping out soon. "Oh Boy!" CBN alternates on SZ schedules. GTW handled QRR traffic for Port Jervis. BLU is active on 14 mc. and QSO'd D4GAD. FWC increased power to 220 watts. CQA has 200 watts input perking FB. During flood the Raytheon Mfg. Co. ran out of glass for tubes. HLB contacted 1KH, took message for Corning, N. Y., and 'phoned, costing HLB $1.35. The glass was shipped with credit to HLB. SZ reports 14-mc. 'phone perking FB. CC has had 1111 QSO's with VK5HG on 7 mc. BJA is still pounding away. 83's don't perk for HCM. HCP left for Wash., D. C. IYH is rebuilding. HUV is getting out nicely with 35 watts on 14-mc. 'phone. HLB is new Pres. of Albany Radio Club. AGA is on 14 and 3.9-mc. 'phone with 850 watts, P.P. 150T's. GXM during recent flood said, when water got up around his house, "Move your row boat, mister, I want to back my car out." (Per GFW and BLU). ITK reports for Kingston hams: 1VS is heard again. HUK is building crystal rig. JFE is working on 3.5-mc. c.w. rig. ITK completed 1.75- and 3.5-mc. flea power rig. BNR is quite a horse trader. IUR is going in for 50T's. HUB is heard on C.W. BDB is praying for i.f. transformer for his new super het. HUM is coming home with the robins.

Traffic: W2EGF 636 HYC 536 LU 220 FQG 172 CBN 78 GTW 58 BLU 50 FWC 36 GPB 69 CQA 29 HLB 23 SZ 18 CC 14 BJA 11 HCM 9 HCP-IYH 2.

NEW YORK CITY AND LONG ISLAND—SCM, Ed. L. Baunach, W2AZV—APV is out for O.P.S. IOW is out for O.R.S. BGO had busiest month handling flood and tornado traffic. IOP was excused from school to operate during the flood. JGC sent in his first report. The B.C.L.'s blame HRT for local QRM. At last PF is on the air with a 3OFX. EAR is expecting an addition to his family. EYQ's neighbor's pigeons killed themselves on his antenna. HXT is taking a trip out west to see 5ELC. ING is working up a 7 mc. net. HGO was heard in Austria. EVA has considerable calls heard cards from the DX contest from the foreigners. If any of the gang will drop him a self-addressed envelope he will forward them. JGR put up a new 3.5-mc. zepp with the aid of AQN, FIS and IXN. DOG keeps a schedule with his home town in Pa. through 8CQA. IOR's new rig: 74 crystal, 801 buffer, '03A final. CYX is installing a 3OFXC. JKB is grid modulating an 802 on 1992.5 kc. IPB reached his half-way mark for W.A.S. GVX is grid modulating a 150T on 14 mc. HKO is overhauling. HNJ has not yet graduated from a self excited rig. Speaking of old age QSL's, EXR received one just three weeks short of a year. AZV is looking for members for the N.C.R. INI reports the passing of FX on April 6th. HMJ swapped crystals but finds QRM too much. GDF is doing FB work checking bad signals. JET wants a job so he can buy radio parts. HUI is going on 14-mc. 'phone and 7-mc. c.w. ECL can be heard on 3504 kc. 2SC is on the air every night except Sunday from 6:30 to 9:30 p.m. or later as traffic demands (frequently also afternoons 1 p.m., to about 4 p.m. then from about 5 p.m. to 6:30 p.m. he is free to work schedules with anyone). At 6:30 p.m. he goes into the A.A.R.S. net as WLN. Equipment is housed in a one time ammunition storehouse located in famous old historic fort on hill surrounded by large moat with actual portcullis and drawbridge still there! Ted Fisher, 2SC opr., is 23 years of age and has lived in every continent. IVL is is getting out. JHB started on the all star rig. DUN is on a buying spree. FEO let license expire. JGC bought JHB's old rig. ELN moved to new QRA. IQZ needs a J for W.A.C. CTK is leaving 2S for 3.5 mc. FCQ is on 14 mc. JMN, a newcomer in Brooklyn, is on with '47-'10. AYN is selling plenty of autos.

Traffic: W2BGO 272 KI 243 CYX 210 IBT 188 EYQ 146 EYS 73 IHT 40 EXR 58 AZV 40 FF 38 HBO 35 PF 28 ECL 27 IOP 25 GDF 23 HRA 22 BYL-HGO 15 HMJ 10 ADW 9 FLD-BKP-IZJ-BMM-FIP-CP 8 GES 7 AA-ING 6 CIT 8 HJT 5 BIK 4 HXT-APV 3 ENS 4 JGR-GVX-DBV-FOH-HWR 1 JHB 5 JGC-IVL 2 DUN 12. (Feb.-Mar. BGO 271).

NORTHERN NEW JERSEY—SCM, Chas. J. Hammersen, W2FOP—GGW is now using break-in. GGE is now working with a 242A final. HZY has worked 8 countries and 43 states on 3.5 mc. HBQ will remain active throughout the entire summer. HNP finally got his rig on 14-mc. 'phone. CGG was active handling flood traffic during the recent disasters. GMN is responsible for several new O.R.S. from Elizabeth. GVZ has new Eimac 300-T on 3.5 mc. running between 800 and 1000 watts input. IAP is new O.R.S. appointee. GAS is working in the gas station! HTW schedules HFT through local net. HQL is looking for more Fort Monmouth traffic. HTX is working out more schedules. 1AMZ transferred to Glens Fall, N. Y., for the summer. HFT is contemplating working 56 and 28 mc. BZJ has a new FB7A receiver. Since CIZ has more time to be on the air he is really finding out what the average ham means when he talks of QRM. ICJ makes application for O.R.S. CJX worked his second Siberian. IQM visited headquarters at West Hartford. HRN has had 504 QSO's since he got his ticket and finds that there are some real old timers still on the air. GSA is back from Virgin Islands after maiden cruise. BZJ has good Trenton schedule. HBO is looking for prospective O.R.S. in Ocean and Monmouth counties. AFU is on 28 mc. along with AIW. DDY is QRL N.C.R. GPI is still with U.S. Coast Guard at Buffalo. GAS is going strong with traffic. DVM is back on the air. FOP, the S.C.M., wishes to take this opportunity to thank and congratulate all those who took part in handling flood traffic during the recent disasters. Fine work, fellows. Your S.C.M. has received a splendid response to his request for O.P.S. appointees last month. As this issue goes to press we have under way a new O.P.S. set up through the help and coöperation of the Plainfield Radiophone Association. JCT joined the N.C.R. JLO is new Bloomfield ham. ILL worked K5HG with a single '10 final, 60 watts input. HNX is spending most of his time reading back numbers of *QST* trying to get up to date. BTZ is new Official Observer. CQX is rebuilding. CAY spent a few days in Ohio. GCV will have new rig on soon. IYU has a Comet Pro. ABS is back on the air. GON worked plenty of DX in the recent contest. IKD is splitting the air waves on 56 mc. HVK is thinking about joining the N.C.R. HNP is working DX on 14-mc. 'phone. IYT worked his first W6. DKA is new O.P.S. appointee. BTZ wants O.P.S. ENZ is back in the O.R.S. fold. FZE is back on 1.75 mc. DZS is going on 56 mc. EUI and ING are working out on 28 mc. GUH and EBR are working on 56 mc. FTL is having his license renewed. GIZ is getting loaded down with foreign QSL cards. DZ is working on 7-mc. meters as his BRC. GNN built preselector for his super. U.C.A.R.A. have a club party on 7 mc. every Sunday morning. GYY received O.P.S. appointment. GZG has new 211-D and 1½-kw., 1200-v. transformer. JDO is putting 511 and Class B modulators in new 1.75-mc. 'phone rig. HLX is playing with "long lines" on 56 mc. IWU plans 112-mc. operation. IBZ has W.E. 252-A on 3.5 mc. IMB gets much DX on 1.75-mc. due to new antenna. DAC ran entire transmitter from his car generator in recent A.A.R.S. Emergency Test. JDY is on 56 mc. in addition to 3.5 mc. FFY is back from a visit to his folks in Johnstown, Pa. JAB sticks firmly to 7 mc. Plainfield Radiophone Association Vigilante Committee is on the trail of bootlegger using GYY's call on 28-mc. c.w. The Association is also doing O.O. work on 1.75 and 4-mc. 'phone bands in an attempt to help operating conditions in their area.

Traffic: W2BCX (WLNF 549) 1325 GGW 540 GGE 419 HZY 326 HBQ 266 HNP 208 CGG 90 CMN 88 GVZ 76 IAP-FOP 69 GAS 279 HEG 75 HTW 87 HQL 80 HTX 54 1AMZ-2 48 2HFT 43 BZJ 32 CIZ 22 ICJ 19 ECO 12 HOZ 11 CJX 8 DPA 6 IQM 5 HRN 4 (Feb.-Mar. 2BCX 1566-WLNF 730).

NEW ENGLAND DIVISION

CONNECTICUT—SCM, Frederick Ells, Jr., W1CTI—All operators in the State are to be complimented on their fine cooperation in handling flood traffic. The fellows near the flooded area worked until they nearly passed out from lack of sleep. Hats off to the gang that were ready when the emergency arose. One 42 with 8 watts got out OK for BDI for 57 hours when power was off at West Hartford. MK was flooded out by high water and INF has been issued O.R.S. appointment to temporarily take its place. FIO schedules 9ESA three times a week on 7 mc. CNU quit work at request of Stamford Gas & Electric Co. to go on the air and handle flood traffic. The following members of C.B.A. were active in flood traffic handling: CNU, HYF, CTI, EER, APZ and IOV. IKE says JIV is new ham in Waterbury. AFG handled some press during the emergency along with regular traffic. JGO set up an emergency rig at Glastonbury during the flood and handled a total of 47. DLX made

W.A.C. GTW had QRR schedule with ILF-1. CJD is going on a trip to Calif. Best of luck, Gil, and hurry back. GKM reports formation of Trinity College Radio Club, 1JUD. HYF is trying for W.A.S. DGG worked 7 Europeans and K4KD on 3.5 mc. during DX tests. CEJ had complaint from a B.C.L. that his keying relay was being heard by ear three houses away! Bed rock responsible. GC was on 14 mc. for DX. The Bridgeport Amateur Radio Association held a very successful State Convention at the Stratfield Hotel April 4th and 5th. 1KH was toastmaster at the banquet held Sunday afternoon. All the gang had a fine time. Many thanks, B.A.R.A. Reports from all amateurs in the Conn. Section are welcomed, whether A.R.R.L. members or not. Drop a line to 1CTI on the 16th. HPI/XO handled 720 emergency messages during flood in 3½ days on 56 and 3.5 mc. UE relayed to Red Cross and Army Base via WLM and 1ZQ during the same period. INP stood watches four days at 1INQ-1, Wells Hall, East Hartford, during the flood; he was forced out of his house by the flood and was very busy with Naval Reserve guard duty and cleaning house.

Traffic: W1HPI 906 UE 252 DOW 50 JTD 15 BDI 355 GME 211 JHK 162 FIO 142 DMP 87 BHM 80 CNU 80 IKE 68 AFG 52 JGO 47 DLX 21 CTI 20 GJW 17 CJD 14 EH 11 GKM 10 JUD 2 6LWP-1 8 HYF 6 DGG 6 CEJ 6 BNB 3 GTX 2 ES 36 AFB 100.

MAINE—SCM, John W. Singleton, W1CDX—GOJ has taken over the schedules on trunk line C. AQW did fine work during the flood. INW hopes to get a receiver that will work soon. FAP has a new arrival, a girl. Congrats, OM. DHH is working lots of DX. CDX wants a sky wire like the one at BWR. JJF has new emergency transmitter. BWR is working hard in A.R.R.L. and U.S.N.R. nets. ATA is rebuilding. APR has new Super Pro. AQD has FB 56 mc. rig. EZR is back on 3611 kc. BTG graduated from Mass. Radio and is now looking for a job. VF was all set up for an emergency, long before it came along, FB. The following stations were on the job during the flood: IST, IOM, IVV, AQW, VF, BWR, ALO, APX, CDX, BOR, AKT, ABQ, OR, GOJ, DHH, FAP, INW, EEY, DOZ, PD, CFO, FBJ, MT, BEZ, IMD, ATO, APR, EF, BEU, JQU, FCE, BZS, IER, AQD, DFQ, BWB, DAY, IUV and IIE. If your call isn't listed, give us the dope and we will see that you receive full credit in this column.

Traffic: W1GOJ 241 AQW 168 INW 106 IKC 60 FAP 91 APX 25 DHH 8 CDX 69 JJF 4 BWR 107.

EASTERN MASSACHUSETTS—SCM, Albert N. Giddis, W1ABG—HXE's antenna blew down again. ABG attended convention and shook more fists than F.D.R.! HWZ kept busy during emergency. IWC is still going great guns. EVJ visited ABG and IP. FRO paid her bet to the S.C.M.! ASI worked plenty hard on New England Division convention. QW says a new crop of "young squirts" are coming along. KH is probably still drawing lucky numbers out of a box! ABD says B.C.L.'s don't appreciate his efforts on 56 mc.! JSK just returned from vacation down South. BEF was washed out by flood waters. HCH worked four new countries in DX tests. BR is installing directional rotary beam for 14 mc. JIQ is working out FB on 56 mc. GMD is the new P.A.M. for this Section. HKY is trying to see how many tubes he can burn up! EPZ is going on 3.5 mc. soon. ANM applied for O.R.S. and wants schedules. ISM says school cuts in on his radio. ACM was disgusted with the way some hams misused their facilities during flood. BMW has a new YL. HXK is going on 7 mc. with a new 211 tube. JID is having receiver trouble. JWA is another new Lowell station. JIQ, JNU and NM report for the first time. BB is back ragchewing on 7 mc. HRE and QF worked hard with the National Guard during the flood. IZL handled flood traffic at IZL. WV knocked off his 83rd country. AKS is catching up on lost sleep. KB reports by Postal Telegraph. DCW handled 350 flood messages. HWE put in 77 hours on flood work. IUQ has gone to C.C.C. Camp. The clubs are very active right now and almost every club in the Section was represented at the N. E. Division Convention. I can't say that I am bursting with pride over the showing this Section is making in the Cairo Survey Reports. How about it, you club members? Are you going to let S.W.L.'s show you the way? Tsk, tsk! Congratulations to those who, during the emergency knew when to keep their transmitters OFF the air. Listen, gang, how about getting your reports in ON TIME? You may find it hard work to get your single report in on the 16th, but how about the S.C.M. who has, not only one, but 40 or 50 such reports to make up? Give us a break. Thanks.

Traffic: W1HXE 307 ABG 275 HWZ 210 IWC 179 EVJ 156 FRO 139 FCR 136 JL 129 ASI 118 QW 90 (CC1C 77) KH 84 RE 71 ABD 62 JSK 55 BEF 44 BR-HCH 31 JNU 30 NM 23 JIQ 19 GMD 18 HKY-EPZ 13 ANM-JCK 11 GGB 10 HRE 9 GEX-CIK-ISM 8 ACM-BMW 4 HXK-JID 3. The following A.A.R.S. stations reported traffic: 1AKS 1332 KB 900 DCW 550 (WLGJ 148) HWE 357 ZQ 336 INI 250 CKV 1625 TY 469 DDE 205 ECK 159 JBI 125 BDC-GBW 123 HJS 89 JFS 86 IUX 84 AIX 78 INA 72 AAR 52 IVC 47 ILD 46 JQH 38 AGX 32 CLN 30 AYN 22 IPA 22 IYU-EUS-IUQ 16 FFD 15 KK 13 CCL 12 EMG 7 AAU 6 JCG 4 EAU 3.

WESTERN MASSACHUSETTS—SCM, Percy C. Noble, W1BVR—New appointments: AJD—R.M. of Hampden & Hampshire Counties; JAH—R.M. of Berkshire & Franklin Counties; DDK—N.C.R. Liaison R.M. BKQ has new 250 watt rig completed. BVG sends his usual good total. GZL is taking in all the conventions. IOT is building new transmitter. JGY and FOY joined the National Guard as radio operators. GUO's radio time is bothered by school and baseball. BAP is rebuilding home 56 mc. rig which was ruined in flood. BNL has a five inch oscilloscope. ISN is busy in P.B.N. net. COI is having good luck with 14-mc. 'phone.

Traffic: W1BVR 311 (WLG 152) BKQ 202 BVG 134 (WLGE 70) GZL 132 IOT 123 JAH 100 AJD 80 DDK 44 ASU 36 EOB 35 GUO 31 IIP 26 ICP 20 JBU 15 IYY 14 ATK-DIF 12 BAP 11 JNA 9 FXO 7 AAY 6 BNL-ISN 5 NS 4 DJQ 3 COI 2 IJR 565 AWW 316 ZB 18.

NEW HAMPSHIRE—SCM, Robert Byron, W1AVJ—AUY is the new President of the N.E.D.R.A. Congrats, Henry. EWF has made W.A.C. twice on 28 mc. DUK is now an O.B.S. He is leading the state in the DX contest with BFT giving him a good run. UN is still on the job at Pinkham Notch. JSL called his first CQ, and 8 answered and JSL was so surprised he pulled the switches, instead of going back at him! BJF has gone and done it, got married. Congrats to both. FFL is still pounding out the traffic. HJI reports being heard in England on 3.9 mc. with 56 watts input. GOC is going to do some rebuilding. ARE is new 3.5-mc. station in Hampton. CEA is going strong. GIU has new RK-20 on and sounds FB. GMM announces the arrival of a junior operator on March 31st. Congrats, OM. ANS was busy during the flood. IDY reports the same old schedules. JDF has new rig working very fine. IP reports traffic has dropped off and he has spring fever. EFE seems to have been converted by the flood; says he spent five days in church and has not got over it yet. EAK, reported as the Mayor of Derry, was busy with EFE during the flood. BCP is building a Jones exciter unit. With the appointment of BFT as Emergency Net Route Manager please address all your inquiries about any emergency net work to him. He will see that you get all the dope and advise in which net and on what frequency you will be placed. One net is in charge of him, the other in charge of FFL. A very fine time was had in Boston at the convention and there was a large delegation of New Hampshire men. Do not forget the Hamfest in Manchester on the 23rd of May, bigger and better than ever.

Traffic: W1FFL 1111 (WLGB 127) ICS 810 IP 492 IJB 305 BFT 273 JDF 149 IDY 86 ANS 50 GMM-ILK 40 CEA 39 AVJ 29 GOC 9 HJI 6.

RHODE ISLAND—SCM, Clayton C. Gordon, W1HRC—DQ handled 12 flood messages during the emergency on 1.75-mc. 'phone, from the Hartford, and Johnstown, Pa., areas. JNO reports his rig working OK on 5 bands; his 56-mc. rig has been heard in New Hampshire. Newport seems to be hanging onto 56 mc. with BLS, BVI, JFF, JIK and JNO as the gang. IHJ has new HRO which gave him good score for the one day he was in the DX contest. IKZ has Commercial tickets, 1st 'phone and 2nd telegraph. IEG was "old reliable" as WLGK during the flood and stood long watches. IZO finally got an A.A.R.S. certificate as N.C.S. out of "ole PL." GTN has the 59-e.c.-crystal exciter part of his 59-RK-20 rig all done and the RK-20 part nearly done, all of which is "standard rack-and-panel" sizes. IPU worked a VK with 2A5-e.c. osc. with 18 watts on 14 mc. ILO is still on 14 mc. That's the trouble with 14 mc., it's too darned "still" according to HRC. AQ sent a goodly number to the Boston Convention-Hamfest, including their Pres. (MacIntyre) and AOP, AVH, CBS, BC, HRZ. INM sent CAB, GTN, HEH, IZO, JAC, DTZ, ARK, EZW, JRY, HRC, FAH, IEG, HJB. Harry Nicholson went and since he couldn't find a "Jeep" anywhere, brought home a 2½ foot thermometer. HRC completed a tri-weekly two year schedule with 2CYX recently.

(Continued on page 80)

(*Continued from page 70*)

W1HHY, was winner with 14 out of a possible 15 points, an excellent record in view of the fact that over six parties passed one of the transmitters without determining its location. The U.S.N.R. meeting was conducted by Lieutenant Commander John Reinartz, W1QP, followed by an A.A.R.S. meeting led by Russell Bennett, W1GTN, and a communications meeting conducted by SCM Fred Ells, Jr., W1CTI. Reinartz followed with an interesting discussion of crystal control on 56-mc. giving much useful data for workers on this band. Arthur Lynch, W2DKJ, told of the interesting 56-mc. work the Garden City Radio Club was doing in preparation for the yacht races to be held this summer. The open forum was conducted by Assistant Secretary Goodman of the A.R.R.L.

The banquet was held in the early afternoon, with 219 present. Director George W. Bailey, W1KH, was a splendid toastmaster, introducing the many speakers with a wit and sincerity appreciated by every one present. Short talks were given by State Senator John Taft, Club President Charles Wight, W1BRL, Irving Strauss, W1CJC, Co-chairman Rulof Fowler, W1ACV, ex-Mayor E. T. Buckingham, Dr. J. P. Vancheri, W8BWH of Punxsutawney, Pa., who did such splendid work during the Johnstown flood disaster, John Reinartz, W1QP, Ted McElroy, and Byron Goodman, W1JPE. Spendid tributes to the value of amateurs in emergency work were paid by Mrs. Ella G. Fleck, head of the Bridgeport Red Cross, and Miss Amelia Wendroth, executive secretary of the Red Cross in New England. Speed pilot Frank Hawks, W1IJI, entertained with some of his flying experiences. Four Canadian amateurs present were introduced, as well as HK1XA of Colombia. The prize drawing was held, and many hearts made happy with the splendid prizes made available by the hard-working committee and the coöperation of the manufacturers and dealers. The convention ended at 8 p.m., and every one left carrying with them the memory of a very enjoyable two days.

Special credit is due the Bridgeport Amateur Radio Association and the fine work of the committee, headed by Rulof Fowler and Gilbert Williams. The club of thirteen members did as fine a job as many organizations of much greater size.

—*B. G.*

Amateurs Carry On

(*Continued from page 26*)

Above Johnstown, at South Fork, J. M. Gates, W8GXU, operated consistently for a period of days. Operators I. L. Mericle and John H. Sefranek of W8MRI-WVH, at a C.C.C. camp near the Quemahoning Dam above Johnstown kept the War Department advised as to the state of the Dam for 20 hours, exploding false rumors of its bursting spread by state and municipal authorities; they were commended by Secretary

of War George A. Dern, Director of Emergency Conservation Work Robert Fechner, and others.

In Sunbury C. W. Knoebel, W8IVO, did outstanding work. George Wendell Carr, W8NNY, Howard English, W8DAV, Elmer Deibler, W8NPQ, and Walter Lovitt, W8GLH, tied in with broadcast station WOKO to handle a lot of traffic. At Altoona David Dodson, W8BEY, and Wm. T. Tobin, W8LIV, were active. George M. Demarest, W8LUM, at a C.C.C. camp near Pigeon, Pa., secured aid for that place when it was isolated through W8BRJ and W8EVX (W8KBM operating).

W8YA, at State College, under the direction of Gilbert L. Crossley, performed splendidly, handling 600 actual messages, 100 being official emergency traffic. Melvin L. Gundrum, W8KRJ, was on 160-meter 'phone in Williamsport. K. W. Zahn, W8ITS, was also active in that city.

S. W. Krute, W8CVS, Wilkes-Barre, stood watch in the N.C.R. net. E. L. Maneval, W8EU, of the same place, on his way home with emergency radio gear, was forced to abandon his car two blocks from home, wade through three feet of swift-running water, barely saved his wife and child, spent a sleepless night in the open, and then was forced to evacuate again; returning home four days later, he set to work to clean out that slimy, primordial-feeling mud . . . mud . . . mud . . .

L. W. Buckalew, Jr., W8ASW, Bloomsburg; A. A. Polityka, Jr., W8FLA, Shenendoah; and W3OK formed a net within the Army net, feeding W8CVS, W8AVK, W3FTK, W3EZ, W8FIG and W8FCB. Although not in the actual flood area, special credit goes to R. A. Sancken, W3BZP, of Chester, who, although bed-ridden and in danger of a serious relapse, was on 110 hours in six days, handling 386 important messages and controlling his A.A.R.S. net.

Other stations active include W8CNZ, operated by Gilroy M. Barker, W8PX, Pittsburgh; W8OVT, 160-meter 'phone; Norvel K. Ramson, Jr., W3CTU, and Clark O. Bartlett, Lehigh University Radio Society, W3AEQ, both of Bethlehem; H. V. Campbell, W8HQL, Duquesne; George W. Evans, W8DYV, Tarentum; C. C. Prewitt, W8GUB, W. R. McShaffrey, W8KF, and Z. E. Forester, W8DGL, all of Monessen; John A. Krupper, W8KVL, Vandergrift; Clyde C. McClymonds, W8GZE Slippery Rock; H. H. Welsh, W8GKI, Ellwood City; and John R. Hart, W8FCB, Duncannon.

New York State: Leslie H. Connelly, W8NEI, Ithaca, operated 80 meter c.w. on behalf of the gas and electric company by which he is employed. Millard J. Hoaglund, W8MBW, on the other hand, handled traffic for the New York Telephone Co. on 75-meter 'phone. W8KXR's work was reported last month; what was not said was that he copied press to fill every column of three front pages of the *Ithaca Journal* via 160-meter 'phone. Raymond E. Jenkins, W8GWY, and Alan F. Burgess, W8CWH, were on in Glens Falls, on the Hudson; two dams north of them were expected to go, but held. L. W. Isreal,

W8AAR, was on in Geneva, Ferris W. Wolfinger, W8CNA, in Binghamton.

The New York National Guard Radio Net, composed of A.A.R.S. stations located in armories, functioned in a wide range of activities during the emergency period. Stations in this net are: W2CA and W2SX, Brooklyn; W2BGS, W2FTH and W2INE, New York; W8OQG, Albany; W2GGP, Troy; W8HJP, Syracuse; W8MMT and W8LJD, Buffalo; W8FCG, Binghamton; W2NY, Yonkers, and W8ELU, Saranac Lake.

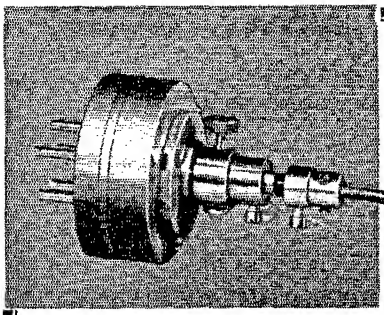
Merrimack River Valley: At Lowell, Mass., C. F. Hutchinson, W1DBE, was the principal contact with outside. He was on for 36 hours, assisted by two National Guardsmen. Al Giddis, W1ABG, set up at Red Cross headquarters and operated on 56 and 3.5 mc. with the assistance of W1JRH. Rev. Arthur F. McQuaid, W1NM; Henry N. Molleur, W1IYT; J. R. Lizotte, W1BTW; John L. Greene, W1JJV, and P. E. Champagne, W1JID, installed communications links for Company "H" of the National Guard between its headquarters and outposts. R. A. Hall, W1QF, and Wilmah M. Getchell, W1HRE, operated in National Guard units under the calls W1HYX and W1KU, respectively. Raymond S. Beale, W1CSU; Henry N. Molleur, W1IYT, and Samuel N. Mack, W1CRO, served as relay stations. R. O. Mulno, W1COX, R. G. Baxter, W1AKE; D. G. Hicks, W1GGB, and Leo F. Jarret, W1LJ, were also active. E. E. Taylor, W1BEF, was out of commission—washed out.

At Lawrence, a combination network of the type that was found so effective in other instances —56 mc. for local work and 3500 kc. for outgoing traffic—was set up, with Clifton R. Wilkinson, W1CRW, H. J. Sevigny, W1IGO, and Lieut. Wm. E. Burton, W1QU, handling the low-frequency end, and Joseph P. Moran, W1BJU/1, W1JNU; Walter B. Ingalls, W1JDK; Herbert W. Fieldhouse, W1IZE; Leo Charette, W1ABD; Manuel A. Vargas, W1ILD; Captain Thomas T. Barstow, W1HYT; F. J. Hickey, W1IWM, and Paul Muller, W1HXE, using five meters. W1HXE operated a total of 146 hours continuously out of 168, making 464 contacts and handling 280 messages. George T. Byrne, W1FCR, and R. H. Gumb, W1FCU, served with National Guard units.

The principal outlet at Haverhill was Burt H. Taylor, W1KB. Three portable rigs came into the city, Vinson G. Blaisdell, W1CKV, at City Hall, W1HXB, and Arthur A. Stockellburg, W1SS. These stations, in addition to Albert F. Nash, W1BQR, and Carroll W. Still, Jr., W1CCF, made deliveries on the spot in the city during the flood and also acted as scout cars for the local police.

Connecticut River Valley: Contrary to the information at hand when the May *QST* report was prepared, amateur radio did serve in Brattleboro, Vt., although not on behalf of the utilities. Ray Flood—true to his name—took his transmitter to Police Headquarters and, operating with emergency power under his call, W1FPS, aided by Sgt. Carl B. Manley, W1BAS; Harold G.

(Continued on page 82)



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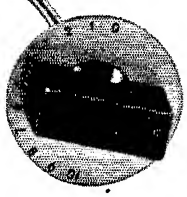

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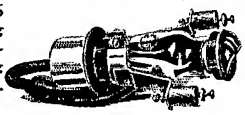
An "RCA Cathode Ray Kit," easily installed on any receiver having Automatic Volume Control, makes your set tune like a '36 model. Kit, including tube, socket, escutcheon, cable, everything needed, only $3.00. Stock No. 9688.



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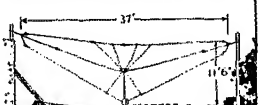

See your dealer or write to Parts Division

RCA Manufacturing Co., Inc.

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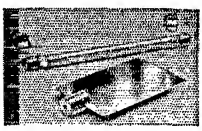

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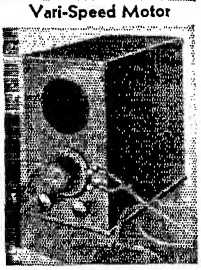

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Absolutely constant speed — new vari-speed control, calibrated in R.P.M. for any constant speed from 50 to 1000. (This type of motor is necessary for expert results.) Makes your oscilloscope a precision instrument. NOW ..... **$9.50** NET

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All essentials included — vari-speed motor, neon tube, etc. — all for net price of..... **$11.50**

Act now. Send your order.

SUNDT ENG. CO.

(Affiliate of Littelfuse Labs.)

4246 Lincoln Ave., Chicago, Illinois

(*Continued from page 78*)

Traffic: W1IEG 233 (WLGK 95) IZO 137 GTN 54 IPU-DQ 12 ILO 4.

VERMONT—SCM, Forrest D. Drew, W1BJP—Special credit is due those amateurs in Vermont who handled traffic during the recent flood. CBW, ATF, BD, AXN, AVP, AOO, FSV, FPS, AHN, EMQ, GGT and DQK are the headliners. BNS has his pilot's license now and is doing lots of flying. GNF is off the air due to the flood and is moving out of the flood area. AVP called at the S.C.M.'s for an evening. Bill has a fine traffic total on 3.9-mc. 'phone. FSV reports schedules with BNS, HOW, IP, GAE and CBW. HOW is also on for schedules. ATF was QRX during the flood and handled some emergency traffic. GGT handled some traffic for the Central Vermont Railroad during the flood. GAE has schedules with FSV and GAZ; with his new super-het receiver and break-in system, he is going FB. AOO is now O.R.S. and tops the traffic list this month; he is on 3579 kc. and invites QSO's with the gang. BJP is very busy this spring but handled a little flood traffic; visited BLC, ATF and GGT; had visits from IQG, BNS, IT and BLC.

Traffic: W1HOW 4 AOO 361 IQG 12 AVP 115 FSV 75 HOW 14 ATF 24 GAE 13 BJP 33.

ATLANTIC DIVISION

EASTERN PENNSYLVANIA—SCM, James M. Bruning, W3EZ—P.A.M.: 3EOZ. R.M.'s: 3AKB, 3AQN, 3EOP, 8ASW. Were YOU on the air last month? If so what did you do? Traffic, experiments or DX results are wanted for this column to put your accomplishment on record and to serve as an inspiration to others. Those who report each month for our Section News have PROVEN that they are not ashamed of their contribution to Amateur Radio. Are you? Brass Pounders this month: W3BZP, WLQA (3OK), 3EOP, 3EBT, 3VR and WLQB (3EOP). 3ADE worked 16 hours daily during flood but found time to handle nearly one hundred messages. AGK is after O.R.S. appointment. AGS took an exam and has returned to the air. AQN bought another car to visit his radio friends. BES worked his 93rd country. BGD worked ten new countries in DX contest. BRZ is new Official Phone Station. BZP is still confined to bed but look at the traffic he handles. DFC keeps busy with radio, school, and the YL. DMQ made W.A.C. three times in ONE week. Also W.A.C. and W.B.E. on both 7 and 14 mc. as well as T.B.T.O.C. EBP keeps 3885 kc. hot with traffic. EEW and 8EU believe the 'phone men should cut their signals from a 12- to 6-kc. band width before deserving more frequency space. 3EPJ tried for eighteen months to get a VK and then worked three in a row. EOZ (our 'Phone Activities Manager) has a recording device set up ready to take down transmissions of those who refuse to play square. ETM wants reliable station in Bucks county to join A.A.R.S. net. EUP questions what can be done in future emergencies to silence those amateurs (?) who have no special work to do. EWJ worked an F8 while using 25 watts on 3.5-mc. c.w. EYO has new t.r.f. receiver. EZ has new ACR-175 receiver. FBJ sends his first report. FDF worked his first ZL. FED needs Asia for 28-mc. W.A.C. FKX is operating portable in Phila. MG renewed his Official 'Phone Station (OPS) rating. OK is new Official Observer and is watching for 3500-kc. razor-edge boys who have 3499 whiskers. VR is again O.R.S. 8ASW (Route Manager) calls attention to the consistently good work done by O.R.S. and A.A.R.S. in his corner of our Section. BFF is another of our Official Observers constantly checking on our signals. CKC from Danville, N. Y., has been visiting East Penna. amateurs. DIG and 3OK have been laying out emergency net for use of Lehigh Valley R. R. 8EKG is playing Lone Wolf at present on account of his work-hours but makes a respectable traffic showing. ITS, one of our Official Phone Stations, has installed a new 300 watt 14-mc. 'phone. IWT is back in the traffic game. FLA handled W.U. and Postal Traffic during flood. MRQ and NNC are new O.R.S. OML has received eight S.W.L. 3.5-mc. cards from Germany. The Olney Radio Club recently affiliated with A.R.R.L.

Traffic: W3BZP 1091 EOP 582 (WLQB 531) EBP 579 VR 549 EZ 466 AKB 272 ADE 110 EYO 95 AGK 94 AQN 87 ETM 55 BYS 54 EPJ 47 EWJ 45 FKX 22 FED 19 MG 16 FBJ-EUP-EOZ 6 BGD 2. W8FLA 463 (WLQG 76) ASW 279 IWT 183 EKG 110 DIG 96 MRQ 83 NNC 64 BFF 51 OML 24 ITS 8 EU 5. W3OK (WLQA 707).

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA—SCM, E. L. Hudson, W3BAK—3CXL, 3EOU, 3CQS, R.M.'s. 3BWT, Chief R.M. 3WJ, P.A.M. W3CXL/WLM were very busy handling flood emergency traffic. With two operators, they kept on the air for 120 hours continuously. Sgt. Ed. Day is expecting to be back on the job around July 1st. BWT handled a lot of personal messages from several flood areas. EPD works VK's on 7 mc. and handled flood messages. WJ is doing fine work as an O.O. CQS will use a pair of 802's in the final, 'phone and c.w., of new rig. EHW contacted two new countries. FSP expects to become O.R.S. soon. FRV has a new Vibroplex. CDG is making plans for summer rebuild. BHE has an emergency transmitter and power supply; he handled some QRR traffic during the recent flood emergency. CWE again reports from Michigan college. AED, of Ocean City, Md., is on the air with a fine 'phone and c.w. transmitter; he also has a new HRO receiver and an oscilloscope. FQL and FQH are getting gray hairs trying to get monitors to work. BFX worked VU5X. FSA and ECU got marooned in flood at Cumberland, Md. ETE is still trying to get out with low power on 7 mc. EYF is going to 56 mc. GCE, a new ham, has a '10 in TNT. FCC has 801 in final. EXY is rebuilding to an 801 final. CDB is putting in c.c. EMQ has 56 mc. aspirations. FJE needs Nevada, Wyoming, Idaho, and New Mexico for WAS; he uses 7105 and 7162 kc. between 9 p.m. and 1 a.m. every night.

Traffic: W3CXL 616 (WLM 2482) BWT 627 CIZ 512 BKZ 89 EZN 42 EPD 26 FPQ 18 WJ 17 CQS 15 EHW-FSP-BAK 7 FRV 6 CDG-CAB 5 BHE 1.

SOUTHERN NEW JERSEY—SCM, Carroll D. Kentner, W3ZX—Emergency flood work was the highlight of activities this month. Practically all of the Official stations in the section took part, and splendid work was done. FTK nearly made B.P.L. on his flood traffic alone! DNU is now A.A.R.S. and has new receiver and 40-foot masts. ARV and FOS are new O.R.S. BEI's total is mostly flood traffic. ARS at Wildwood Auto Show turned in splendid total and conducted a fine amateur radio display. ARW was spliced Easter Sunday. APV took 53 messages in one hour and forty minutes. BIR was kept out of the DX Contest by the illness of the XYL. EKL is now O.B.S. DQO has a new Super Skyrider. CLQ, formerly of WAR, is now signing WL at WVZ at Fort Hayes, Ohio. DOR is now A.A.R.S. and reports a visit from 2GQX. FFE's traffic total suffered due to DX contest and baseball. GFK is a new ham in Moorestown. FOS is rebuilding transmitter and receiver. EWF heard K6MWN on 3533 kc. ACD and BAY are each building Comet class sloops. BAY says he will be on the air by June. KW has four dummy antennas for testing his multi-band equipment. DBD worked FA8GK and ZE1JY making 54 countries on his list. DQV has new Comet Pro, and is working three bands with about 70 watts. The section sincerely regrets losing an active O.P.S. and O.B.S.—3COT, Bob Welsh, who is now at VE2ER in Montreal. ZX worked SU8MA on about 14,060-kc. two-way 'phone, also five VK's in two hours, all two-way 'phone. NF is moving back to Easton, Pa., and the Section will lose a swell operator and a fine Route Manager.

Traffic: W3AEJ 9 DQO 42 QL 36 ARS 466 BPT 224 ARV 24 DNU 35 BYR 82 BEI 67 EFM 356 (WLNJ 88) APV 599 BO 61 BIR 6 ZI 202 EKL 391 FTK 1589 FBM 166 FFE 18 FOS 50 EWF 10 BZI 9 ZX 59 EEQ 61 NF 94 (WLML 232) VE 55.

WESTERN NEW YORK—SCM, Charles F. Smith, W8DSS—The S.C.M. is very pleased to note the number of new stations reporting. JTT is away out in front with a truly remarkable total, a goodly amount of which was flood traffic. JQE had hard luck with transmitter. MQX will have to tie a string on his finger. Hi. BJO is rebuilding for a big fall season. BHK and BSU did some fine emergency message handling for the Erie R.R. during the flood. GWY is working away from home but finds time to handle traffic and check up on off-frequency stations. DZF, O.P.S., assisted ABX, ATH and PCZ in emergency work for Electric Co. What a Section this would be if all the O.P.S. would get busy with a few reports. LWD more than doubled his previous total. CSE was QRL out of town stringing new telephone wires. DHQ is going after schedules, traffic and O.R.S. KJW is traveling around the country. MLM has nice total, all handled on 1.75-mc. 'phone. CPJ and LGV are increasing their scores every month. GZM has joined the National Guard in Syracuse. CJJ worked 56 countries in DX contest and made W.A.C. again. LUQ made 17,000 points in same contest and W.A.C.'d three times. GWT copied a lot of press from GUF in Pittsburgh flood area and will take schedules on 14 or 7 mc. KXA will get O.R.S. soon. M.V.B.P., Utica, new officers: Pres., LGR; Vice-Pres., DT; Secy-Treas., JUI. FT. Stanwix Radio Club, Rome, is putting the

rig on 1.75-mc. 'phone. Broadcasting station WHDL, Olean, N. Y., with the corps of licensed amateurs on its staff, EBP, BFN, JMR and DSA, did much important flood work, handling over two hundred personal messages. EWP and EZ are looking for U.S.N.R. prospects. DSS will receive applications for A.A.R.S. FCG, LJD, ELU and HJP handled the armory transmitters in their respective cities during flood emergency and did a very fine job. NWW and OMJ apply for O.R.S. and O.P.S. respectively. Oneida Radio Club is working hard on plans for the big outing to be held at Panther Lake, Sunday, July 19th. Don't forget, W.N.Y Section slogan contest closes in June. Let's have some entries, fellows. 73.

Traffic: W8JTT 1909 DSS 444 JQE 251 MQX 245 BJO 156 MBI 131 BHK 94 GWY-DZF 82 LWD 78 CSE 74 DHQ 64 KJW 43 MLM 33 CPJ 21 GZM 14 LGV 11 CJJ 6 LUQ 4.

WESTERN PENNSYLVANIA—SCM, C. H. Grossarth, W8CUG—LOQ pounded some brass during the flood. EFA says all Brookville hams are N.C.R. members. OFO says MIW helped with the flood traffic. MIW works a lot of DX with a pair of '46's. CMP is still struggling with the ECCCPP! MOT gets that R.M. appointment. DGL says his was flood traffic. HBG wants a Pittsburgh schedule; he handled lots of flood traffic. UR was on 20 hours each day during the flood. IOH operated at INE during the flood. KBM says KUI got a job at St. Marys. GJM says the S.H.B.P. & M. is planning a hamfest for August 12th. CKO was recently married. PX is on 14-mc. 'phone. GUY has the DX bug bad. INE handled the flood traffic for St. Marys. NDE is back on 3.5 mc. KOB has been in Brookville for the N.C.R. KNB is going after some DX this summer. UK had 18 inches of water in the cellar. FIP is tapping out CQ's on the piano. KUN got O.R.S. appointment. LOR is changing his location. IBX will soon be on with a 400 watter. IFY got W.A.S. certificate. FB, OM. LSH works 14 mc. nicely. IOI is rebuilding completely. JZR returns to the air after a long absence. Dear gang: My term as S.C.M. for Western Pennsylvania expires June 15th and since I have no desire to run for the office again I hope that no petitions will be sent to Headquarters with my name on them.—C. H. Grossarth, W8CUG.

Traffic: W8LOQ 347 EFA 182 OFO 531 MIW 56 CMP 34 MOT 624 DGL 48 HBG 134 RG 171 UR 136 IOH 8 KBM 194 GJM 8 GUY 70 ADY 363 INE 612 NDE 5 KOB 40 KNB 178 UK 81 FIP 33 KUN 610 AXD 31 CUG 48.

ROANOKE DIVISION

NORTH CAROLINA—SCM, H. S. Carter, W4OG—The S.C.M. wants to thank the Durham Gang for the fine Hamfest they put on April 5th. It was enjoyed very much by all, and the entire Gang is looking forward to the next one with much interest. Siler City: QI says they are making plans to put on a meeting for the Floating Club there in June. DKF is ragchewing on 1.75 mc. DOR has his new receiver going FB. Greensboro: MR lived on the street that was hit the worst by the tornado but escaped without damage. Graham: CJP has been made O.P.S. AEH handled some traffic on 7 mc. COC has YLitis. Raleigh: DW led the State in traffic this month; he attended the Virginia Hamfest at Charlottesville. Mount Holly: CYY is now WLRR in the A.A.R.S.; he is doing some O.O. work in the Cairo Survey. Belmont: CXO has been appointed O.P.S. DLY is rebuilding. DJY has moved to Montana. Raeford: ANK at C.C.C. Camp handled plenty of traffic with 2½ watts input. Lexington: WX at last got his rig going on 14 mc. Gastonia: DWA is a new ham reporting for the first time. Thanks, OM. CEN had a good score in the DX contest. Tarboro: DCG is working on 7 mc. CCH is hearing Asia regularly. Wilmington: CPT is traveling most of the time and works the fellows face to face. BPL is rebuilding. EC is working on his boat. DYT is a newcomer with a radiotelephone second class ticket. DIE is acting the rôle of hero in a dramatic play put on by the local broadcast station. 3DJC was a visitor in Wilmington. Winston-Salem: CGY and IY are back after long lay-off. 4NC is adding a power supply for bias. ABT has some very good help on the A.A.R.S. CKJ and DWB are active on 3.5 mc. BWC, CFR and CYA are holding down 7 mc. CYA also works 14 mc. at times. RA, CTO and OG are parked on 14 mc. With the 'phones: CLB says the depression is over as he has very little time for radio now. DIS is increasing power. BX has moved. AEN is getting out FB on 14 mc. ALD is still the most consistent 'phone in Charlotte. BQE has his rig ready to go on 1.75 mc. CDQ tried 14-mc. 'phone. CEI moved back on c.w. CZU is about ready to go on all bands. BFB is QRL work. BMR is using an Eimac 50T on 28 mc. CXO rebuilt and gets out FB. CLB visited with MU in Cleveland, Tenn., and talked to ALD and sent some messages home. NP sold his speech amplifier and is back on c.w. 73.

Traffic: W4DW 98 ANK 70 CYY 44 ABT 16 CXO 13 AEH 7 WX-CJP-NC 6 DCG 1 OG 4.

VIRGINIA—SCM, Chas. M. Waff, Jr., W3UVA—FKD needs 4 states for W.A.S. EBK is building new exciter unit. BGS is putting up new antenna. EVN is at Lynchburg College. CFL is using new Collins antenna unit. CGR is experimenting with new metal tubes. FJ is on 'phone occasionally. CQW is operating GBL. EMX has a 211 in final with 200 watts on 'phone. FBL is going QRO; wants O.R.S. ADD worked Egypt and Czechoslovakia. BRA attended Charlottesville Hamfest. AHC handled a bunch of flood traffic. BZE is rebuilding entire rig. ZU delivered flood traffic to UP and WRVA. DZW is getting back on after a year's absence. FUR is trying to get on 28 mc. FQO worked four W6's with 30 watts input. CNY is on 14-mc. 'phone almost entirely. DQB is new O.R.S. and R.M. AKN's new driver unit improved output 30%. FIK is building an FB 'phone rig. MQ has developed a new keying system, without clicks. ELJ handled QRR traffic for A.P. BIW is going to 56 mc. for DX! DEH worked three new countries in DX Contest. The Shenandoah National Park will be dedicated on July 3rd. BIG suggests that the new Skyline Drive is FB for 56 mc. and invites hams to visit if you come for the dedication. WS is ex-W3AAJ (had to have old call cancelled to keep two-letter one). BFW is well pleased with his new HRO receiver. BEK worked K6 and G on 14-mc. 'phone in DX contest. EHL is building new rig, with '03A final. BWA won both prizes in a raffle. EZL is experimenting a lot. GEA is new station in Norfolk. FTC is using '45 TNT with 10 watts input on 7 mc. with good results. CA plans to rebuild during the summer. BSB is trying to get on 28 mc. CIJ is on 1.75-, 3.5-, 14- and 28-mc. 'phone and c.w. FBW is using '45's P.P. TNT. RL was heard off coast of China on 7 mc. CLV handled flood traffic for press. ELF has parts to trade. EMM was high scorer for Virginia in DX Contest with 51,000 points and contacts on 5 bands. CHE also had a high score with 26,000 points. UVA worked W.A.C., W.B.E., and 13 new countries in contest. CCU and KU also made W.A.C. in contest. GDX is new station in Norfolk. FE is QRL work. BRY is experimenting with relays. AIJ is rebuilding and even overhauling shack. EBD is President of V.P.I. Short Wave Club, BYQ is V.P., and ECS Treasurer. 9GGB won intra-mural fencing championship at V.P.I. BZE worked and received a card from OE3AH, the Archduke of Austria! A8K sold his HRO. FEM has RK-20 final and an HRO receiver. Nice reporting, fellows; keep it up! Any one wishing to receive "QRX," send report to S.C.M. regularly. FMY is ex-W2LK, now in Richmond. GFM is new call of EVV in Charlottesville. AVR is QRL work but gets on evenings on 14-mc. 'phone.

Traffic: W3AKN 86 DQB 62 FJ 38 AHC 36 CQW 31 CFL 19 CLV 12 CGR 6 CNY 5 UVA 5 BZE 4 ZU-FQO-BIG-FHF 3 WS-ELJ 2 FKD-EMX-BEK-EBK 1.

WEST VIRGINIA—SCM, Dr. Wm. H. Riheldaffer, W8KKG—BOW had Wheeling police cars delivering flood traffic that could not be delivered via telephone. JWL had continuous half-hour schedules with OIG on March 20th–21st for flood traffic as all other communication failed. MOL on 3.9-mc. 'phone handled 79 flood emergency messages. PME and ANU, new O.R.S., handled flood traffic from Bethany. HD was on A.A.R.S. special frequency during flood for W. Va. traffic. HWT and CVX kept communication channel for WWVA and WMMN throughout emergency period. BOK handled 93 flood messages on 3.9-mc. 'phone, mostly from FRC in Johnstown, Pa. OXO was in the same net. OK has gone B.C.L. MQF is in new QRA. MEK is building P.P. '52 final. AFB finally bought a mike. MUU is second op at NFO—they are now W.A.S. and got 13 countries in DX contest. ATT reports the final card for W.A.C. KBU has new '52 final. TI has taken up new job with G.E. in Erie, Pa. CVX and GEG are with WMMN. KWI hooked both VU2CQ and VU7FY. MZD has 36 countries. JRL hooked VQ8AB for 79th country. PAJ is making the old DX'ers sweat. MOP is on 1.75-, 3.9- and 14-mc. 'phone. OXO moved to Fairmont. MCR is on trunk-line "E" daily. KKG, BOK and MZD attended Virginia Floating Club meeting in Charlottesville Apr. 19–20.

Traffic: W8BOW 39 ATT 88 KBU 13 LXF 10 JWL 34 MOP 2 MOL 79 PME 48 NFO 2 LII 14 HWT 175 MCR 113 NEP 9 OXO 25 KKG 97 AKQ 27 OK 236 HD 95 BOK 93 CVX 76.

(Continued from page 78)

Bover, W1DAQ, and V. C. Morehouse, W1AZV, handled a quantity of press and other information, particularly with regard to the Vernon Dam. W1CBW is reported to have been operating 160-meter 'phone in Brattleboro until power went off.

Up the river, at Windsor, Vt., R. E. Osgood, W1AHN, together with Alvin H. Battison, W1GNF, after moving W1GNF's household furnishings to high ground, prepared emergency equipment and stood by for 43 hours. Fortunately, power and communications remained intact, and they had only incoming traffic to handle.

Additional operators at W1INQ in East Hartford, Conn., were Clayton F. Kiernan, W1GTF, and Edward Van Gasbeck, W1IJO. Later, when W1BEQ of Manchester was near exhaustion, W1GTF relieved him.

At Middletown, Conn., the terminus of the Connecticut River flood, Alexander Thomas, W1ILF, Francis E. Vinal, W1GYJ-W3BXC, established an emergency-powered station in Wesleyan's Scott Laboratory utilizing Dr. Van Dyke's lab power gear. Reed B. Eddy, W1AJB, also did an excellent job on 3500 kc. c.w. W1FLQ was a member of the 5-meter net described last month. Everett B. Gladding, W1GTW-W1GTX, went to New Haven to establish an outside contact for W1ILF.

The call of W1HWZ should be deleted from the list of stations active in the Connecticut Valley work—apparently a case of mistaken identity on the 75-meter 'phone band.

Maine: On March 19th word came to Governor Louis J. Brann that the people of Rumford wished him to declare martial law in their city. Lacking explanatory details, with no wire facilities available, he appealed to amateur radio. W1EFA, W1JOA and W1ERB, operating W1JQU at the 86th Brigade Headquarters Company of the Maine National Guard were able to contact Ray E. Longway, W1IST, within ten minutes and secure the information just before power failed at Rumford. W1IST was able to resume shortly with battery power, however, and skeds were maintained for four days, much important traffic being handled on behalf of all official agencies, including provision of serum, medical supplies, etc.

When martial law was declared in Lewiston, Clayton W. Hansen, W1INW, succeeded in getting information out under conditions of great difficulty.

In Wilton, J. W. Singleton, W1CDX, stood by with emergency equipment in the event of power failure, but the local woolen mill was able to supply the city's needs at almost all times.

ODDS AND ENDS

Roland H. Bouchard, W1BLV, performed several important communications jobs in connection with the Woonsocket, R. I., flood. . . . Howard C. Ayer, W1IIP, did QRR work in Orange, Mass., when that town was isolated by its own private flood. . . . W3FWR was one of

the Washington stations which stood by for emergency work when the water reached a 14-foot level. . . . W2BNL and W2BXO, through the N.B.C. studios in New York, W3CRO through KYW and W3XAU in Philadelphia, and W8DBC through KDKA in Pittsburgh, picked up amateurs in the flood area and rebroadcast their transmissions over the national networks. . . . A number of independent stations did the same thing; one of the unique features of the flood work was b.c. stations and hams holding two-way QSO's. . . . Brigadier General Roger W. Eckfeldt, commanding the northern emergency zone, issued special orders of commendation to W1HXE, W1AKS, W1JDK, W1WI, W1HWE, W1BTW, W1QU, W1CSU, W1CRO, W1IZE, W1JQO, W1BJU and W1BQR. . . . Federal, state and military authorities in many sections, as well as Red Cross officials, public utilities, etc., similarly commended individual amateurs in their bailiwicks. . . . Just 527 copies of the May issue of *QST* were sent to the members of the Senate and the House of Representatives, along with suitable enclosures, to acquaint them with the invaluable work performed by amateurs during the flood emergency. . . .

ADD HONOR ROLL

The following stations should be added to the "honor roll" presented beginning on page 118 of the May issue, under the same qualifications. The asterisk, as before, shows that reports indicate that outstanding work was performed; its lack does not necessarily mean the reverse. Owing to generally incomplete information, no division is made between 'phone and c.w. operation. The list is not complete; obviously, there were many more stations participating in the handling of flood traffic in these and other districts, but at least it does serve to record those of whose performance we have been made aware. The list:

W1ADG, W1AFG, W1AJB*, W1AKS, W1BIQ, W1BSP, W1BVG, W1CB, W1CNU, W1CTI, W1CTR, W1DCW*, W1DDE, W1DDM, W1DMS, W1EGL*, W1FRO*, W1GAZ, W1GCU, W1GMD, W1HBB, W1HLE, W1HWE, W1HXL*, W1IAO, W1ICO, W1IGN, W1IKE, W1IMZ, W1ISE, W1IUI, W1IUQ, W1IWL, W1IYB, W1JFS, W1JGY, W1JHK, W1JOP, W1JPP, W1MX*, W1NF, W1PI, W1RE, W1ZD, W1ZL, W2BCX, W2BLU*, W2BNJ, W2CJP*, W2EAR, W2EYS, W2FSN, W2GTW*, W2GYY, W2HOY, W2IOP*, W2LU, W2SC, W2AIW, W3AOA, W3BHJ, W3BID, W3BYS, W3BZP*, W3CZQ, W3DQ, W3DSI, W3EEK, W3EFM, W3EMR, W3ETX, W3EZ*, W3FFX, W3FTK*, W3HC, W3SN*, W3VR (W3BNS operating), W3ZI, W8AMM, W8AVD, W8CHK, W8DEC*, W8FCQ, W8GOR, W8GUG, W8HMH, W8IAW, W8IV, W8IWT, W8JE*, W8JQE, W8KBM (assisted by W8MJA), W8KEV*, W8KJW, W8KUN*, W8LJD, W8LMI, W8LUI, W8MOT*, W8MQX, W8NDC, W8VI and W8WE*.

The reading for W8OFO in May should be changed to "W8OFO (assisted by W8MIW)*".

The St. Paul's School Radio Club station, W1ILK, operated from the school's electric system by W1IZL, W2IBB and W2FUU handled 40 messages. . . . W8OMJ, Rome, N. Y., was active on 160-meter 'phone and was of considerable assistance to the Curtis Publishing Co. in locating several carloads of paper. . . . W3BEI scheduled W3WX, W8BWH and W8NTP, taking Philadelphia traffic and relaying traffic referred to him through WCAM. W3FIG working with the N.C.R. handled about 1500 messages, operated by Wentz, Martin, and Schuerger, messages phoned by Mrs. Wentz. W3CZQ also did outstanding work with the National Guard, handling over 1000 messages. W3MG, W3AJW, W3DQM, W3SI and W3AQR were on the job at WHP and WKBO and able to operate as amateurs only in spare moments.

Circulation Statement

PUBLISHER'S STATEMENT OF CIRCULATION AS GIVEN TO STANDARD RATE AND DATA SERVICE

This is to certify that the average circulation per issue of *QST* for the six months' period July 1st to and including December 31, 1935, was as follows:

Copies sold	40,946
Copies distributed free	409
Total	41,355

K. B. Warner, Business Manager
D. H. Houghton, Circulation Manager

Subscribed to and sworn before me
on this 17th day of March, 1936.
Alice V. Scanlan, Notary Public

I.A.R.U. News

(Continued from page 42)

when DX conditions show the reaction that followed DX contest—and they're still going down .. .. .. Wonder what the summer will bring?

Special:

The newest of the I.A.R.U. member-societies is the O.V.S.V., representative in the Union for Austria. Despite its newness, this society has already demonstrated an interest in amateur affairs which may well be emulated by some of the older societies. One of the manifestations of this interest is the official organ, "OEM Mitteilungen des O.V.S.V." Although mimeographed, it is turned out in workmanlike fashion, and it contains a good deal of well-authenticated technical material. The latest article to hand contains articles on 56 mc. and antenna design, abstracts from ham periodicals, an interesting article on WAC and other international awards with a detailed statistical analysis, and a number of other editorial features. Membership in the O.V.S.V. costs 12 Austrian shillings annually, or about $2.25 currently. The address is Bahngasse 29, Klosterneuberg, N.Oe.

Where to buy it

A directory of suppliers who carry in stock the products of these dependable manufacturers.

ASTATIC

Crystal Microphones and Pickups

ASTATIC MICROPHONE LABORATORY, Inc. YOUNGSTOWN, O.
Pioneer Manufacturers of Quality Crystal Products

JAMAICA, L. I., N. Y.	Federated Purchaser, Inc.	92-26 Merrick Rd.
NEWARK, N. J.	Federated Purchaser, Inc.	230 Central Ave.
NEWARK, N. J.	Wholesale Radio Service Co., Inc.	219 Central Ave.
NEW YORK, N. Y.	Federated Purchaser, Inc.	25 Park Place
NEW YORK, N. Y.	Harvey's Radio Shop	103 W. 43rd St.
NEW YORK, N. Y.	Wholesale Radio Service Co., Inc.	100 Sixth Ave.
NEW YORK, N. Y. (BRONX)	Wholesale Radio Service Co., Inc.	542 East Fordham Rd.
PHILADELPHIA, PENN.	Eugene G. Wile	10 S. 10th Street
PITTSBURGH, PENN.	Federated Purchaser, Inc.	343 Blvd. of the Allies

BURGESS BATTERY COMPANY

"Chrome" protected

RADIO BATTERIES

Look for the Black and White Stripes

FREEPORT, ILLINOIS

ALBANY, N. Y.	Uncle Dave's Radio Shack	356 Broadway
BALTIMORE, MD.	Radio Electric Service Co.	303 W. Baltimore St.
BOSTON, MASS.	Radio Shack	46 Brattle Street
HARTFORD, CONN.	Stern & Company, Inc.	210 Chapel Street
JAMAICA, L. I., N. Y.	Federated Purchaser, Inc.	92-26 Merrick Rd.
MONTREAL, CANADA	Canadian Electrical Supply Co., Ltd.	285 Craig Street, West
NEWARK, N. J.	Wholesale Radio Service Company	219 Central Ave.
NEWARK, N. J.	Federated Purchaser, Inc.	230 Central Avenue
NEW HAVEN, CONN.	Hatry & Young	86 Meadow St.
NEW YORK, N. Y.	Federated Purchaser, Inc.	25 Park Place
NEW YORK, N. Y.	Harrison Radio Company	12 West Broadway
NEW YORK, N. Y. (BRONX)	Wholesale Radio Service Company	542 E. Fordham Rd.
NEW YORK, N. Y.	Wholesale Radio Service Company	100 Sixth Avenue
PITTSBURGH, PENN.	Federated Purchaser, Inc.	343 Blvd. of the Allies
SPRINGFIELD, MASS.	T. F. Cushing	349 Worthington St.

super skyrider hallicrafters ultra skyrider

ALBANY, N. Y.	Uncle Dave's Radio Shack	356 Broadway
BALTIMORE, MD.	Radio Electric Service Company	303 W. Baltimore Street
BOSTON, MASS.	Radio Shack	46 Brattle Street
HARTFORD, CONN.	Radio Inspection Service Co.	227 Asylum Street
NEWARK, N. J.	Wholesale Radio Service Co., Inc.	219 Central Ave.
NEW HAVEN, CONN.	Hatry & Young	86 Meadow Street
NEW YORK, N. Y.	Gross Radio, Inc.	51 Vesey St.
NEW YORK, N. Y.	Harrison Radio Co.	12 West Broadway
NEW YORK, N. Y.	Harvey's Radio Shop	103 W. 43rd St.
NEW YORK, N. Y. (BRONX)	Wholesale Radio Service Co., Inc.	542 East Fordham Rd.
NEW YORK, N. Y.	Wholesale Radio Service Co., Inc.	100 Sixth Ave.
READING, PENN.	George D. Barbey Company	404 Walnut St.
RICHMOND HILL, NEW YORK	Marine Radio Company	124-11 101st Ave.
SPRINGFIELD, MASS.	T. F. Cushing	349 Worthington St.

E. F. JOHNSON COMPANY

MANUFACTURERS OF RADIO TRANSMITTING EQUIPMENT

WASECA, MINN. U.S.A.

JAMAICA, L. I., N. Y.	Federated Purchaser, Inc.	92-26 Merrick Rd.
MONTREAL, CANADA	Canadian Electrical Supply Co., Ltd.	285 Craig Street, West
NEWARK, N. J.	Federated Purchaser, Inc.	230 Central Avenue
NEWARK, N. J.	Wholesale Radio Service Company	219 Central Ave.
NEW YORK, N. Y.	Federated Purchaser, Inc.	25 Park Place
NEW YORK, N. Y.	Harrison Radio Company	12 West Broadway
NEW YORK, N. Y. (BRONX)	Wholesale Radio Service Company	542 E. Fordham Rd.
NEW YORK, N. Y.	Wholesale Radio Service Company	100 Sixth Avenue
PITTSBURGH, PENN.	Cameradio Company	603 Grant Street
PITTSBURGH, PENN.	Federated Purchaser, Inc.	343 Blvd. of the Allies
READING, PENN.	George D. Barbey Company	404 Walnut Street

Listings on this page do not necessarily imply endorsement by QST of the dealers or of other equipment sold by them.

Where to buy it

A directory of suppliers who carry in stock the products of these dependable manufacturers.

RAYTHEON AMATEUR TUBES

ALBANY, NEW YORK	Uncle Dave's Radio Shack	356 Broadway
BOSTON, MASS.	Littlefield-Greene Corporation	588 Commonwealth Ave.
BOSTON, MASS.	The Radio Shack	46 Brattle Street
BOSTON, MASS.	Selden Radio Company	28 Brattle Street
BUFFALO, NEW YORK	Radio Equipment Corp.	326 Elm Street
CONCORD, NEW HAMPSHIRE	Carl B. Evans	80 N. State Street
JAMAICA, L. I., N. Y.	Federated Purchaser, Inc.	92-26 Merrick Rd.
NEWARK, NEW JERSEY	Federated Purchaser, Inc.	230 Central Avenue
NEWARK, NEW JERSEY	Wholesale Radio Service Co.	219 Central Street
NEW YORK, N. Y.	Federated Purchaser, Inc.	25 Park Place
NEW YORK, N. Y.	Harrison Radio Company	12 West Broadway
NEW YORK, N. Y.	Harvey's Radio Shop	103 W. 43rd St.
NEW YORK, N. Y.	Wholesale Radio Service Co.	100 Sixth Avenue
PITTSBURGH, PENN.	Federated Purchaser, Inc.	343 Blvd. of the Allies

RCA de Forest RADIO TUBES

RCA Radiotron Division of RCA Manufacturing Co., Inc.

ALBANY, N. Y.	Uncle Dave's Radio Shack	356 Broadway
BALTIMORE, MD.	Radio Electric Service Company	303 W. Baltimore St.
BOSTON, MASS.	H. Jappe Company	46 Cornhill
BOSTON, MASS.	Radio Shack	46 Brattle Street
HARTFORD, CONN.	Hatry & Young	203 Ann Street
JAMAICA, L. I., N. Y.	Federated Purchaser, Inc.	92-26 Merrick Rd.
NEWARK, NEW JERSEY	Federated Purchaser, Inc.	230 Central Avenue
NEWARK, N. J.	Wholesale Radio Service Co.	219 Central Avenue
NEW HAVEN, CONN.	Hatry & Young	86 Meadow Street
NEW YORK, N. Y.	Bruno-New York, Inc.	460 W. 34th St.
NEW YORK, N. Y.	Federated Purchaser, Inc.	25 Park Place
NEW YORK, N. Y.	Royal-Eastern Electrical Supply Co.	16 West 22nd Street
NEW YORK, N. Y.	Sanford Samuel Corp.	136 Liberty St.
NEW YORK, N. Y. (BRONX)	Wholesale Radio Service Co.	542 E. Fordham Rd.
NEW YORK, N. Y.	Wholesale Radio Service Co.	100 Sixth Avenue
NEW YORK, NEW YORK	Harrison Radio Company	12 West Broadway
PHILADELPHIA, PENN.	Eugene G. Wile	10 S. 10th Street
PHILADELPHIA, PENN.	Raymond Rosen & Company	117 North 7th St.
PHILADELPHIA, PENN.	M & H Sporting Goods Company	512 Market Street
PITTSBURGH, PENN.	Federated Purchaser, Inc.	343 Blvd. of the Allies
PITTSBURGH, PENN.	Cameradio Company	603 Grant Street
READING, PENN.	Bright & Company	8th & Elm Streets
SPRINGFIELD, MASS.	T. F. Cushing	349 Worthington Street
WASHINGTON, D. C.	Sun Radio & Service Supply Co.	938 F Street, N. W.

RCA AMATEUR RADIO EQUIPMENT

RCA Victor Division of RCA Manufacturing Co., Inc.

ALBANY, N. Y.	Uncle Dave's Radio Shack	356 Broadway
BOSTON, MASS.	H. Jappe Company	46 Cornhill
BOSTON, MASS.	Radio Shack	46 Brattle Street
CAMDEN, N. J.	Radio Electric Service Company	811 Federal Street
ERIE, PENN.	J. V. Duncombe Company	1011 West 8th St.
GREENWICH, CONN.	Mead Stationery Company	252 Greenwich Ave.
HARTFORD, CONN.	Hatry & Young	203 Ann Street
HARTFORD, CONN.	Radio Inspection Service Co.	227 Asylum Street

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Where to buy it

A directory of suppliers who carry in stock the products of these dependable manufacturers.

MONTREAL, CANADA	Canadian Electrical Supply Co., Ltd.	285 Craig Street, West
NEWARK, N. J.	Wholesale Radio Service Company	219 Central Avenue
NEW HAVEN, CONN.	Hatry & Young	86 Meadow Street
NEW YORK, N. Y.	Bruno-New York, Inc.	460 W. 34th St.
NEW YORK, N. Y.	Harrison Radio Co.	12 West Broadway
NEW YORK, N. Y.	Sanford Samuel Corporation	136 Liberty Street
NEW YORK, NEW YORK	Grand Central Radio, Inc.	124 E. 44th Street
NEW YORK, N. Y. (BRONX)	Wholesale Radio Service Co.	542 E. Fordham Rd.
NEW YORK, N. Y.	Wholesale Radio Service Company	100 Sixth Avenue
PHILADELPHIA, PENN.	Radio Electric Service Company	3145 N. Broad Street
PHILADELPHIA, PENN.	Radio Electric Service Company	N. E. Cor. 7th & Arch Streets
PHILADELPHIA, PENN.	M & H Sporting Goods Co.	512 Market Street
PITTSBURGH, PENN.	Cameradio Company	603 Grant Street

Use SHURE MICROPHONES

Microphone Headquarters

ALBANY, N. Y.	Uncle Dave's Radio Shack	356 Broadway
BOSTON, MASS.	H. Jappe Company	46 Cornhill
BUFFALO, N. Y.	Radio Equipment Corporation	326 Elm St.
JAMAICA, L. I., N. Y.	Federated Purchaser, Inc.	92-26 Merrick Rd.
NEWARK, NEW JERSEY	Federated Purchaser, Inc.	230 Central Avenue
NEWARK, N. J.	Wholesale Radio Service Company	219 Central Avenue
NEW YORK, N. Y.	Harrison Radio Co.	12 West Broadway
NEW YORK, N. Y.	Wholesale Radio Service Company	542 E. Fordham Rd.
NEW YORK, N. Y.	Wholesale Radio Service Company	100 Sixth Avenue
NEW YORK, N. Y.	Sun Radio Company	227 Fulton Street
NEW YORK, N. Y.	Federated Purchaser, Inc.	25 Park Place
PITTSBURGH, PENN.	Federated Purchaser, Inc.	343 Blvd. of the Allies
READING, PENN.	George D. Barbey Company	404 Walnut Street
SPRINGFIELD, MASS.	T. F. Cushing	349 Worthington Street

TRIPLETT INSTRUMENTS

ALBANY, N. Y.	Uncle Dave's Radio Shack	356 Broadway
BOSTON, MASS.	Radio Shack	46 Brattle Street
BOSTON, MASS.	Selden Radio Company	28 Brattle St.
HARTFORD, CONN.	Hatry & Young	203 Ann Street
JAMAICA, L. I., N. Y.	Federated Purchaser, Inc.	92-26 Merrick Rd.
MONTREAL, CANADA	Canadian Electrical Supply Co., Ltd.	285 Craig Street, West
NEWARK, NEW JERSEY	Federated Purchaser, Inc.	230 Central Avenue
NEWARK, N. J.	Wholesale Radio Service Company	219 Central Ave.
NEW HAVEN, CONN.	Hatry & Young	86 Meadow Street
NEW YORK, N. Y.	Federated Purchaser, Inc.	25 Park Place
NEW YORK, N. Y.	Wholesale Radio Service Company	542 E. Fordham Rd.
NEW YORK, N. Y.	Wholesale Radio Service Company	100 Sixth Avenue
PITTSBURGH, PENN.	Cameradio Company	603 Grant Street
PITTSBURGH, PENN.	Federated Purchaser, Inc.	343 Blvd. of the Allies
READING, PENN.	George D. Barbey Company	404 Walnut Street

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Strays

Recently revised bulletins on resistors for service replacement and general amateur use are now available from the Ward Leonard Electric Co., Mount Vernon, N. Y. The bulletins are Nos. 507-A and 507-D.

Hams, especially those located in the vicinity of Washington, D. C., or San Francisco, will be interested in the U. S. Hydrographic Office Charts No. 5199 (for Washington) and No. 5199a (for San Francisco) which give distances and directions from these points to all other important points on the globe. They are obtainable from the U. S. Hydrographic Office, Washington, D. C., for 40 cents each.

"Cold Dry" Crackle Finish

(Continued from page 19)

be necessary to put on an undercoat of flat black or black lacquer. When a metal panel is to be finished, it should be thoroughly cleaned with a good grease solvent, such as a high grade naphtha, or better still lacquer thinner. After cleaning it should be handled as little as possible, as the natural oil from the hands that will get on the surface to be painted will retard the drying, as well as prevent adhesion. This is a very important factor to bear in mind if you expect to get a durable, uniform finish. In finishing wood, Masonite, or other porous material, the surface must be built up in order to prevent absorption. This may be done by applying several thin coats of shellac, or a quick-drying enamel. Shellac is preferable if time is to be considered.

The drying time, under laboratory conditions, which very rarely exist outside, is about twelve hours. Under ordinary conditions the shrivel enamel will get hard in about two days. This does not mean that it cannot be handled before that time; the writers have put panels and apparatus into use in about four or five hours. A little care must be taken in handling so soon, to prevent skinning the enamel off. The drying time can be greatly reduced by the application of a small amount of heat. In the winter place panels near a warm radiator, or in the summer put them in the sun. Do not allow them to get too hot as the enamel will blister. This small amount of heat (temperature between 70 and 90 degrees) is applied for about two hours. By that time the enamel will be dry enough to touch, but not hard. It will harden overnight. If all work is finished on the panels before painting they can be put into use before they are thoroughly hard. The additional hardening time is of little interest, except when the apparatus must be handled.

If a little care is given to the application so that the thickness of the coat on each panel is about the same, the shrivel will be uniform, and the panels will match very well. Thus with very little effort on the part of the amateur his station can be made very professional-looking.

HAM-ADS

(1) Advertising shall pertain to radio and shall be of nature of interest to radio amateurs or experimenters in their pursuit of the art.
(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others.
(3) The Ham-Ad rate is 15c per word, except as noted in paragraph (6) below.
(4) Remittance in full must accompany copy. No cash or contract discount or agency commission will be allowed.
(5) Closing date for Ham-Ads is the 25th of the second month preceding publication date.
(6) A special rate of 7c per word will apply to advertising which, in our judgment, is obviously non-commercial in nature and is placed and signed by a member of the American Radio Relay League. Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, if by a member of the American Radio Relay League takes the 7c rate. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and takes the 15c rate. Provisions of paragraphs (1), (2), (4) and (5) apply to all advertising in this column regardless of which rate may apply.

Having made no investigation of the advertisers in the classified columns, the publishers of *QST* are unable to vouch for their integrity or for the grade or character of the products advertised.

QUARTZ—direct importers from Brazil of best quality pure quartz suitable for making piezo-electric crystals. Diamond Drill Carbon Co., 719 World Bldg., New York City.

RADIO engineering, broadcasting, aviation and police radio, servicing, marine and Morse telegraphy taught thoroughly. All expenses low. Catalog free. Dodge's Institute, Byrd St., Valparaiso, Ind.

NATIONAL—Hammarlund, Patterson used sets, 60% off list. W3DQ, 405 Delaware Ave., Wilmington, Del.

CLASS B transformers—Universal for two or four 46s, 210s, 800s, RK18s, etc., $7.75 pair postpaid. 70 watts audio from 46s, 100 watts from 10s. Write for details. W8UD, Douglas, Mich.

CALLBOOKS—new DX calls, new prefixes, thousands of new W and VE calls, in the spring 1936 Radio Amateur Call Book. Sent postpaid $1.25, or a whole year (four issues) for $4. (In foreign countries $1.35 and $4.35.) Your call and QRA printed in large type, $1. per year. Radio Amateur Call Book, 610 S. Dearborn, Chicago.

QLS'S, W2SN, Helmetta, N. J.

QSL cards, two color, cartoons, message blanks, stationery. Snappy service. Write for free samples to-day. W1BEF, 16 Stockbridge Ave., Lowell, Mass.

QSL's. Free samples, W8DDS, 2156 West 80th Street, Cleveland.

COMPLETE training, amateur licenses; $1.50 weekly. Resident and correspondence courses. Booklet. New York Wireless School, 1123 Broadway, N. Y.

FOR sale. 3-750 volt, 150 watt generators $11. each. Also a few other generators and motors. Wilmot Auto Supply Company, 1970 Wilmot St., Chicago.

CRYSTALS 80 and 160 meter bands 95¢. 40 meter band $2. Holders 60¢. White Radio Lab., Sandpoint, Idaho.

MOTORGENERATORS—⅓ H.P. 60 cycle motor, 500 volt 75 ma. and 7.5 volt 2.8 amp. d.c. Just the thing for transmitters. $12.50 while they last. Electronic Products Co., St. Charles, Ill.

SELL—110 a.c. 500 d.c. Westinghouse motor generator in good condition, fifteen dollars. W9CDE.

SELL—big discount—complete. Slightly used Collins 45A xmtr equipped police freq. coils. W9CIY.

SELLING out. 1 Collins 32B xmtr complete with ant. matching network. 1 piezo Astatic crystal microphone with three stage preamplifier. All other equipment. W9GBY.

WESTERN Electric volume level indicator #518-B rack and panel type with tube for sale suitable for Broadcast stations or P.A. systems. Richard Gustin, 136 W. Broadway, Bangor, Me.

WILL sell for cash my Hammarlund Comet Pro with Peak pre-selector. Perfect condition. Am purchasing Super-Pro. W1WR.

QSLs, SWLs. Cards of quality. Samples (stamps). W8ESN, 1827 Cone, Toledo, Ohio.

WANTED—good HRO complete, transmitter above 100 watts output, commercial built, complete. Cash or trade. Wooster Richard, 4 East 72 St., N. Y. C.

FOR sale: A-1 AGSX 1935. Five sets coils with panel-speaker-power supply, $125. DeMarco, 111 So. 4th, Easton, Pa.

AC-SW3—4 sets coils, tubes, power supply $25., N.R.I. radio course $7., transceiver $7., bug $4., monitor $3., key $1. W1HJI.

FOR sale—150 watt c.w. and phone transmitter—211 class C—801's class B. WAC on c.w. full details on request. W3FIL, 5010 Pine Street, Philadelphia, Pa.

WEBSTER 300 watt rack amplifier with tubes $135. Shure condenser mikes, tubes $12. Platten Radio Company, 112 S. Washington St., Green Bay, Wis.

QSLs. Free samples. Printer, Corwith, Iowa.

BLILEY crystals! (stocked). Patronize W8DED.

QSLs! World's finest! Samples? (stamp) W8DED, Holland, Mich.

CALLBOOKS (summer) $1.25. W8DED.

RME-69's! Write W8DED.

CRYSTALS: Specials for June only: $1.95 "X" cuts, 80M. $1.55. $3.25 four cycle "V" cuts, 80M–160M, $2.25. Beautiful Formica holders, genuine GR plugs, $1. Request catalog, Ham Crystals, 1104 Lincoln Pl., Brooklyn, N. Y.

HAMMERLUND Comet Pro receiver, crystal, AVC, coils 8 to 550 meters, excellent condition. $55. W2CUZ, 50 Briggs Avenue, Yonkers, N. Y.

RAW quartz—finest quality, for the manufacture of piezo crystals. Largest, most complete and varied stock in America. Brazilian Importing Co., Inc., 6 Murray St., New York City.

SELLING out—new and used transmitting equipment, tubes, low and high power. Public address equipment, receivers and parts. Over 500 items. Write for list and description. Stamp appreciated. W9CKU-W9BKK, Heron Lake, Minn.

USED RCA 852, $8. Wanted RK28. W1ITK, Southboro, Mass.

SELL complete Thordarson audio with 4–46's class "B" steel chassis $55. Various tubes, parts. Am interested in Collins 32-B if cheap. W5CQF, New Orleans.

ORDERING RME-69? Write W5CQF, New Orleans, La.

CRYSTALS; Zero cut. Guaranteed to compensate at near zero without oven control. Your approximate frequency, 80 or 160 meters $1.85. Ordinary zero cuts $1.35 postpaid. Blanks 65¢. Plug-in holders 75¢ dozen $6. Crystal quartz, will cut twelve crystals $1. Fisher Lab., 4522 Norwood Street, San Diego, Calif.

SELL—2 Esco Dynamotors—12–500 volts, 100 watts $16 each, both $27. Ferd. Mann, 84 Horatio, N. Y. C.

FIRST $47 takes new condition RCA 136. W9OC, Spencer, Iowa.

SELLING out. Write for descriptive apparatus price list W3AAJ, 2817 Montrose Ave., Richmond, Va.

HAM receiver $6. W1FWD.

GE two string oscilloscope. $100. GR13B beat frequency oscillator, new $200. Mims Radio, Texarkana.

WE 203B. VI panel, Complete $25. RCA 17C line equallizer. $50. Mims Radio, Texarkana.

SURPLUS broadcast and amateur equipment and tubes. Stamp for list. Mims Radio, Texarkana.

JENKINS and Adair, Sampson broadcast audio units. All types, high fideity. $2.00. Mims Radio, Texarkana.

RME 9Ds, 10 meters, complete $75. Comet Pro, crystal, complete $55. SW3, $10. SkyRider, crystal, $40. Mims Radio, Texarkana.

GENERAL Radio 457A modulation meter, AC operated. $50. W5BDB.

HIGH power transmitter, 801, 800, 203A, 849 final, 10 Weston meters, 2 power supplies, beautiful work. Complete with tubes $300. Modulation equipment extra. W5BDB.

SNAPPY—these new all-welded relay racks, chassis panels, Hi-Power equipment. Rectifier Engineering Service, 4837 Rockwood Road, Cleveland, Ohio.

TELEPLEXES, ominigraphs, vibroplexes, meters, receivers, bought, sold, traded. Ryan Radio Co., Hannibal, Mo.

SELL RCA 845 modulator slightly used $8. Emerson midget broadcast receiver $12.50, cost $33. Both guaranteed. W8DWJ.

QSLs. Finest at lowest prices. Maleco, 1512 Eastern Parkway, Brooklyn, N. Y.

QSL's, 300 one color cards $1. Samples. 2143 Indiana Avenue, Columbus, Ohio.

NEW York distributor Eidson's 40 meter crystals $1.50. Only insulex 40 meter holder on the market $1. W2GWS, 8834 209th. Street, Queens Village, N. Y. Telephone Missouri 7-0454.

SELL or trade Barr DB3 transceiver, tubes, W2AWU.

THICK cut 20 meter xtals. $5.50. W9TJW.

CRYSTALS—fully guaranteed. 80–160 bands. Y cut $1., X cut $1.50. Within five kilocycles, postpaid. Herbert Addington, 2252 North LeClaire, Chicago.

CRYSTALS, X or Y cut, 1750 to 2000; 3500 to 4000. Exact frequency, 1" square $2.50. Less than 1", within ten kilocycles $1.35. Roughcut blanks 60¢. Oscillating blanks 85¢. Small, irregular shaped blanks, five for $1. Dustproof, plugin holders 85¢. William Threm, W8FN, 4021 Davis Ave., Cheviot, Ohio.

SACRIFICE McMurdo silver custom built masterpiece all-wave superhetrodyne seals unbroken. Glenn Watt, Chanute, Kans.

SELL 800 watt cw 500 watt phone transmitter operating 20 meters. Metal rack, bakelite panels, fourteen Weston meters. Uses 59 xtal 46 doubler, 800 buffer, 242A buffer, pushpull 150Ts final. Two modulators, low 4-210s, high 2-203As. Heard in every continent. Accept best offer over $350. Photo if really interested W2EDW.

RACKS—panels, refer March Ham-ads. Special combination offer. Cooley-Storrs, 11 Olds Place, Hartford, Conn.

COLLINS' new 30FXC transmitter for sale. The filaments have been lit only 30 hours on this job. Write for details. W9NHF.

$1.50 will buy an Eidson "T-9" 40 meter crystal, accurately calibrated and fully guaranteed see previous Hamads. Something new:—attractive and efficient Insulex (low-loss ceramic) 40 meter plugin holder only $1.10 postpaid, very FB. "Eidson's", Temple, Texas.

CRYSTALS 40 meter band x cut $1.85. Guaranteed satisfaction or money back. 80-160 bands $1.50. Omaha Xtal. Labs., 501 World Herald Bldg., Omaha, Nebr.

PORTABLE tube checker, commercial, $15. WE microphone $5. Permanent mignet laboratory speaker $6. Two 16 gauge Aluminum panels abt 19" x 30" $3. ea., parts, RK18 rack panel xmitter, custom job. $100. Xtals. $1.50 ea. Parts. W1AAX, 225 W. 5th South Boston, Mass.

160-80 crystals: Specializing in crystals for the most exacting requirements. "Y" and "AT" cuts, absolute zero temperature coefficient, exact specified frequency $4.95 less than 4 cycle coefficient, approximate frequency $1.85, exact $2.70 "AT", less than 10 cycle coefficient $1.50 "Z", approximate frequency $1.25, exact $1.95. Calibration accuracy 99.99%. Holders $1. Blanks. Southwest Piezo Service, Box 792, Abilene, Texas.

QSLs! Brand new ideas for DXers or rag-chewers. Free samples to Hams only. W2FJE, 145 Lafayette Avenue, Brooklyn, N. Y.

SELL trade breting 12 receivers, golden voice motorola, RK20, 852, 212D, Want RK28. W8IV, Argyle, N. Y.

NEW Eimac 35T's $8.00 W8ANT.

W9ADN crystals are sold direct only to give you custom made accuracy and output. Plus or minus 3KC of requested frequency. Temperature coefficient, 0.000004, 80-40 $3.75, Unmounted. Lockport, Ill.

WESTON meters volts 2-0-3: 0-3; 0-30; 0-50; 0-100; amps 0-5. Jack Tyler, Creskill, N. J.

TRANSFORMER new Hilet 2½ KW—110/220 volts 3000-2400-1850 each side cost $78. Sell or trade for gun camera—binoculars machinery or what have you. Leitch, Park Dr., W. Orange, N. J.

TRANSFORMERS. Mounted terminal strips. Finished in crinkle enamel. 1000-750-0-750-1000, 200ma $5.30; 300ma, $6: 1575-1350-850-0-850-1350-1375, 300ma, $7.50; 500ma, $11: 2500-2000-0-2000-2500. 750W; $13. Spear Manufacturing Co., Waterville, Ohio.

WANTED: HRO receiver complete, W9GLR, Mason City, Iowa.

CRYSTALS:—X-Y, cut, 160, 80, meters $1.50: 40 meters $2.25; 450-550 kc. filter crystals, $3. Postpaid. Specify cut and frequency. Supplied within 3 kc. Satisfaction guaranteed. Chicago Crystal Labs., 2651 Lunt Ave., Chicago, Ill.

WANTED—new or used, factory or home-built, 1 KW 10 meter phone transmitter. Cash for bargain. W1AA. Auburndale, Mass.

NEW Sargent receiver. Covers 10 meter Band $64.50. W8ANT.

WANTED RK28 in A1 condition, Delta AD13, AD22, AD32, AD42, AD1011, AD91, AD75, Thordarson 6878, 5338, 5922, G. R. forms, Dunco relays Bradley Radiostat, Weston or Jewell flush type meters. Haynes, 1912 Begole, Flint, Mich.

QSL's, Samples W8LQM.

SINGLE RK-20 transmitter. Works 80-40-20 meters phone and CW. Custom built in black wrinkle steel cabinet. Separate power supply included. Best of parts. Price of $79.50 includes RK-20, 2-886, audio tubes and DB microphone—Harvey Tri-Tet and PP RK-20 amplifier mounted rack style with four Triplett meters. Coils and crystals for 80-40-20 meter operation furnished as well as 2-59 and 2-RK-20 tubes. No power supply. Same as *QST*, August 1934, page 27. Price $89.50. Harvey Radio Labs., Inc., 12 Boylston Street, Brookline, Mass.

PYREX 3" stand-offs 35¢ W8ANT.

QSL's special introductory offer. Radio Headquarters, Ft. Wayne, Ind.

SELL—nearly new S-9 Skyrider 10 meter band perfect. Want A#1 Universal screen grid 250 cheap. W7EMQ.

NEW RCA ACR136 $60. W8ANT.

TRANSMITTERS constructed. Save 25% State requirements fully. Howard Radio, 154 Pine Avenue, Chicago.

PEAK preselector $12. or swap for transceiver. Pfanstiehl receiver with cathode ray tube $60. 3000V-1KW power supply complete $25. W9HYO.

849-$30. 851s-$40. 212Ds-$8. Universal SG 250W-$12. Oil condensers, chokes, class B xfmrs, few meters. Ewing, 1057 Pratt, Chicago.

USED receivers W8ANT.

METERS repaired—reasonable prices. Braden & Apple Co. 305 Park Dr., Dayton, Ohio.

RELAY racks cheap W8ANT.

SELL—All Star, Jr. super, 8-550 meters, regenerative i.f., s/s results. Excellent condition. $25. W2IXQ.

NAVY type R. F. chokes 35¢ W8ANT.

QST—silencers $4; one IF $6.: Power supply 1100V-150MA: 500V-85MA; 7 ½V-3A; 2½V. 5V-3A: AC filaments $22.50: 5 Meter receiver $9.50. Crystals X cut to frequency $2. 7MC. $2.85: 10Mtr. Convertor $10.50. All equipment completely built. We build to order. Precision Radio Laboratories, 109E 94ST. Brooklyn, N. Y.

ALL lines of new and used amateur equipment for sale. Your used equipment accepted in trade. Before you buy, write to Southern Ohio's only amateur owned amateur business. Jos. N. Davies, W8ANT, Box 602, RR 9, North Bend Road, Mt. Airy, Cincinnati, Ohio.

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Everything for the amateur

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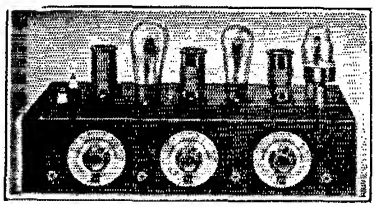

GROSS C C TRANSMITTER—OUTPUT 25-30 WATTS

The "CW-25" transmitter kit due to its low cost makes it possible for anyone to own a modern crystal controlled station. A schematic hook-up and parts layout sheet as well as tuning instructions are furnished, thus enabling the most inexperienced operator to wire and put the set on the air, for real results. The "CW-25" is supplied with a shrivel finished sturdy metal chassis under which all parts are mounted, making the wiring and components dust-proof. A plug-in crystal holder is furnished with the kit. Only one milliammeter is required for tuning the transmitter and each stage is provided with a jack for this purpose. The "CW-25" uses one '47 as crystal oscillator, one '46 as buffer or doubler and two '46's in the amplifier stage, set of three coils supplied with kit for 20, 40, 80 or 160 band. Additional coils 75c each.

Complete kit, less tubes and crystal..... **$14.95**

P-25 POWER SUPPLY — for CW-25 transmitter with matching chassis — $11
450 volts at 200 MA, choke input — complete kit, less tube.....

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New! Hallicrafter Sky-Buddy

5 Tubes Superheterodyne, Built-in Power Supply, and Speaker **$29.50**

Tuning from 18 to 555 meters

Hallicrafters Ultra Skyrider

5–10 METERS*

*ACTUALLY 3.9 TO 46 METERS

With the new LAMB NOISE SILENCER. *A ten-tube Superheterodyne of remarkable sensitivity and many features.*

With tubes.....$99.50. Tubes, crystal.....$114.50
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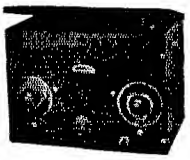
SUPER-SKYRIDER

Complete.....$79.50. With crystal.....$89.50
SUPER SEVEN, complete..... 49.50
HAMMARLUND "SUPER PRO" SP-10, complete.....223.44
SP-10X, complete with crystal filter.....241.08
RME69, receiver only.....118.80
RME69, complete, tubes and mounted speaker. 134.90

RCA–175 AMATEUR RECEIVER

Complete with Tubes, Crystal, Speaker.....$119.50

The "EAGLE" Three-Tube Short-Wave Receiver



"Band Spread" over any portion of the tuning range — only finest material used thruout. Employs one '32 R.F., one '32 detector and one '33 Pentode Audio — 15 to 200 meters — four coils, supplied. The "EAGLE" is economical — two dry cells will operate the filaments.
"Eagle" completely wired and tested..... $11.95
Three tubes tested in your receiver..... $3.00

KEYING RELAY

will operate on one dry cell. Can be used as Single Pole Single Throw or Single Pole Double Throw. Sturdy construction, has ⅛" diameter Solid Silver Contacts. Compares favorably with expensive types. Special..... 59c

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600 volts each side of C.T. 200 MA 2½ V. 10 amps. C.T., 5 V. 3 amps. 7½ V. 3 amps. C. T..... **$2.45**
THORD. CHOKE 12 H 250 MA.....$1.95
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MAC-KEY

Semi-Automatic and Straight OSCILLATOR..... $3.95 **$7.95**

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Cased, 3½" Meters. 0–5 to 0–1000 MA. In all standard ranges....$3.35

HOYT BAKELITE CASE HOT WIRE ANTENNA METER

3¼" Across Flange, Mounts through 2½" hole. Scale Length 1¾". Ranges: 0/1.5; 0/3; 0/5 Amps..$3.50

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866 Heavy Duty.....$1.65
825 Carbon Plate 40 Watts 750 V.. 4.95
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HD203-A Carbon Plate — out of top, $17.50

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ISOLANTITE TOPS
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866-A 10,000 volts inverse Peak.. 1.85
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EXTRA SPECIAL MOUNTED, UNCASED TRANSFORMERS
500–750–1000 volt each side of C.T. 300 watts.....$5.50

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Performance — Ruggedness — Power — Price

35-T Output 38 to 112 watts...$8.00
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Exact Frequency if in stock

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less tubes, batteries and accessories. Bulletin on *request.* **$16.20**

CASED POWER TRANSFORMERS
650 v. ea. side C.T. 350 ma. fila. 2–7½ v C.T. and 1–5 v will give 500 v with choke input using 83 or 5Z3 tubes. You can run your entire R.F. and class B off this trans.....$5.50
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(The ideal job to give 750–1000–1250 v D.C. with choke input)
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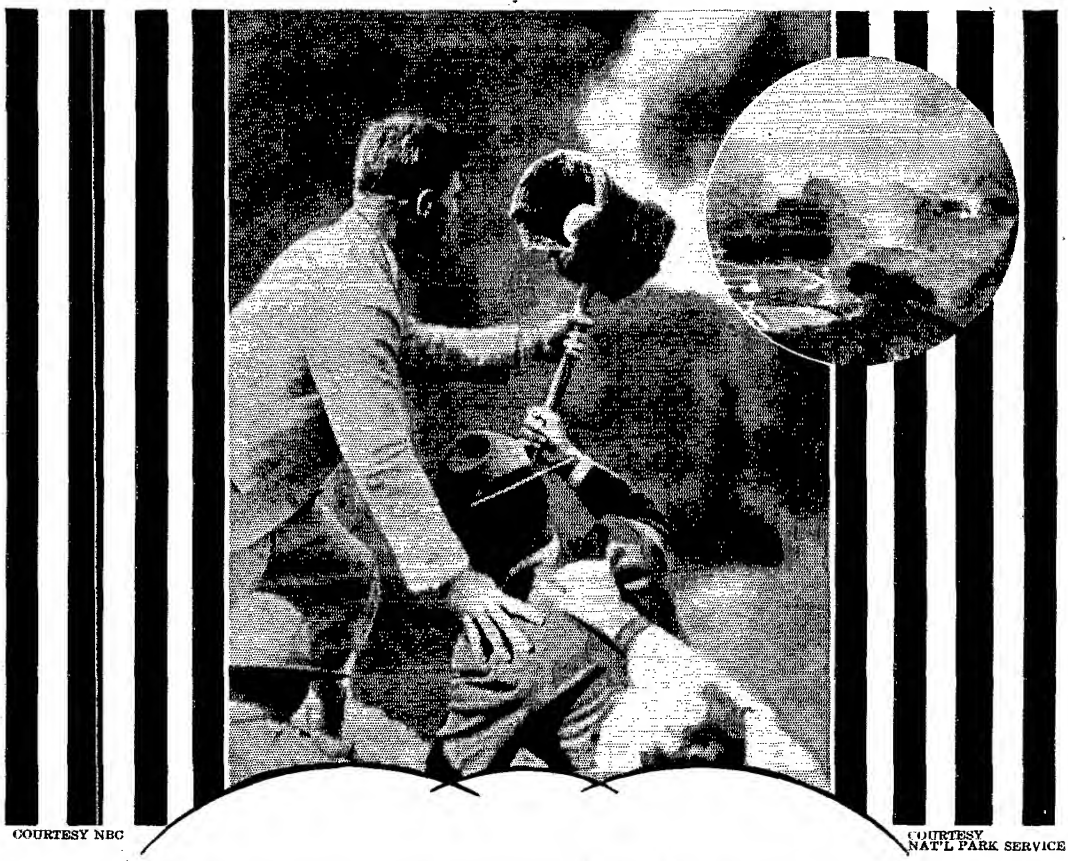

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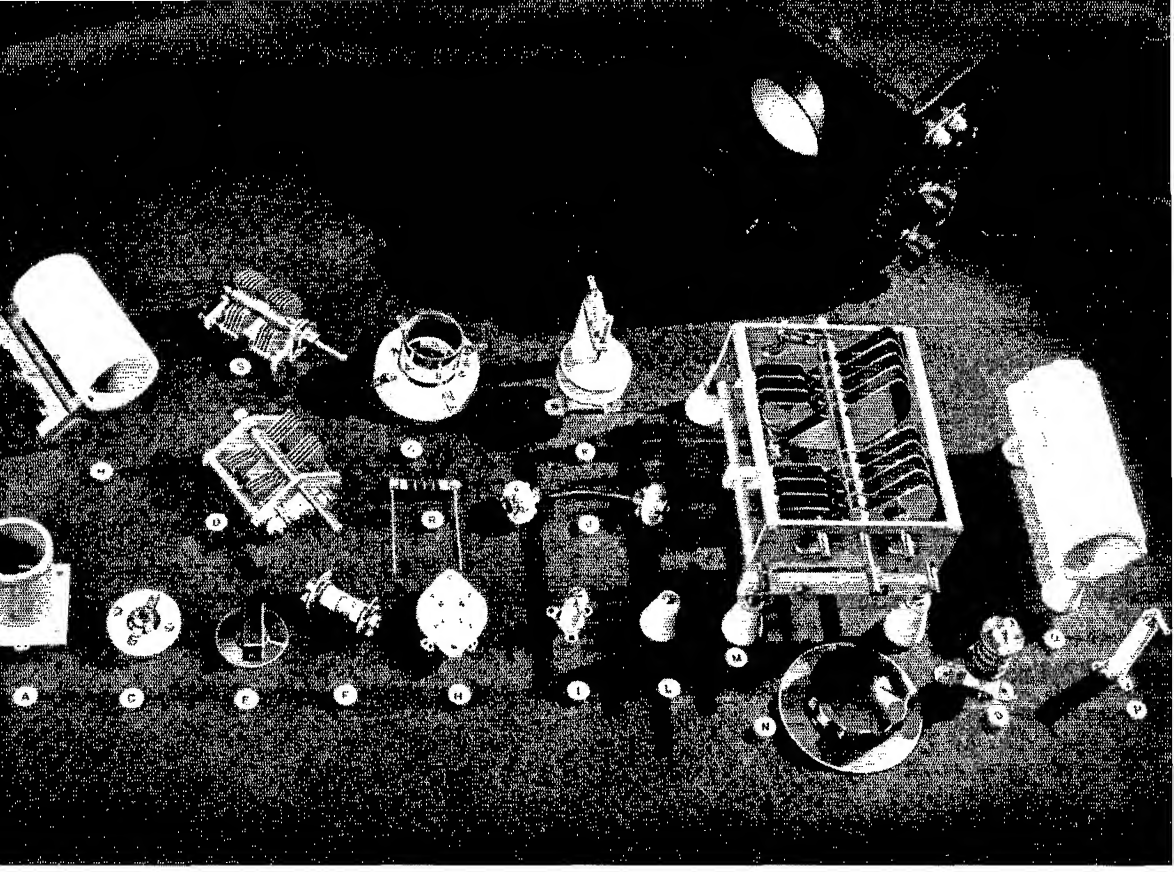

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WHEN building or remodeling your transmitter, remember there is no substitute for National Radio Products, either in quality or in price. Genuine National parts will insure better performance of the old rig and peak operating efficiency of the new. A highly efficient R. F. Amplifier may be built around the recent Eimac 35T's or the RCA 800's with the group of parts illustrated above. They are ideally suited in every particular for this application.

NOTE: Alternative Parts are listed in groups

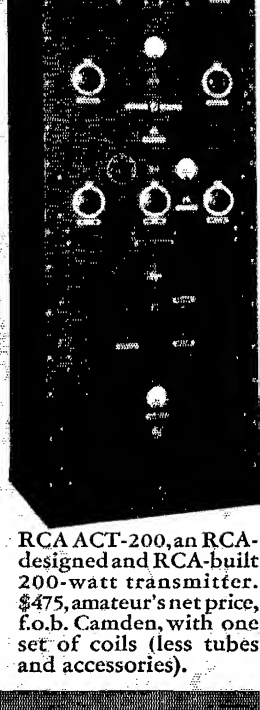
A. XR-6 Coil Form with Square Socket
B. UR-13 Buffer Coil Form Assembly
C. TX-9 Shaft Coupling
F. TX-1 High Voltage Coupling
J. TX-12 Flexible Shaft Coupling
D. TMS-100D Condenser
S. STD-50 Condenser
E. HRO Dial-type 10-0
N. O-Dial-type 0-100
P. GS-2 Stand-Off Insulator
Q. XR-10A Coil Form (with GS-5 Stand-Offs)
G. XM-10 Transmitting Socket
H. 4-Prong Tube Socket
I. GS-1 Stand-Off Insulator
L. GS-5 Stand-Off Insulator (recommended for constructing home-made neutralizing condenser)
M. TMA-50DA Condenser (with GS-5 Stand-Offs)
O. R-154U Choke
R. R-100 Choke
K. NC-800 Neutralizing Condenser
In the background. CRO Cathode Ray Oscilloscope.

The parts listed above are fully described either in our general catalog No. 250 (which is bound into the ARRL Handbook) or in the recent supplement to this catalog. The supplement also describes in detail other recent additions to our line and may be had from any official National dealer or by mail direct from us.

NATIONAL COMPANY, INC., MALDEN, MASS.

MORE WATTS MILES O.S.I.S PER DOLLA

THE ACT-200 is conservatively rated at 200 watts output on phone and 260 watts output on C-W. It will bring to your shack RCA's high engineering skill, practical experience gained in long years of commercial work, and extreme accuracy in manufacture. There is actually no amateur transmitter with such a background as this, except its companion 40-watter, the new ACT-40. This new transmitter will bring to you a tremendous satisfaction, not only in pride of ownership but in easy, reliable operation and the world-wide contacts its power makes possible. Write for complete details of this professional-type transmitter for amateur use.



RCA ACT-200, an RCA-designed and RCA-built 200-watt transmitter. $475, amateur's net price, f.o.b. Camden, with one set of coils (less tubes and accessories).

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